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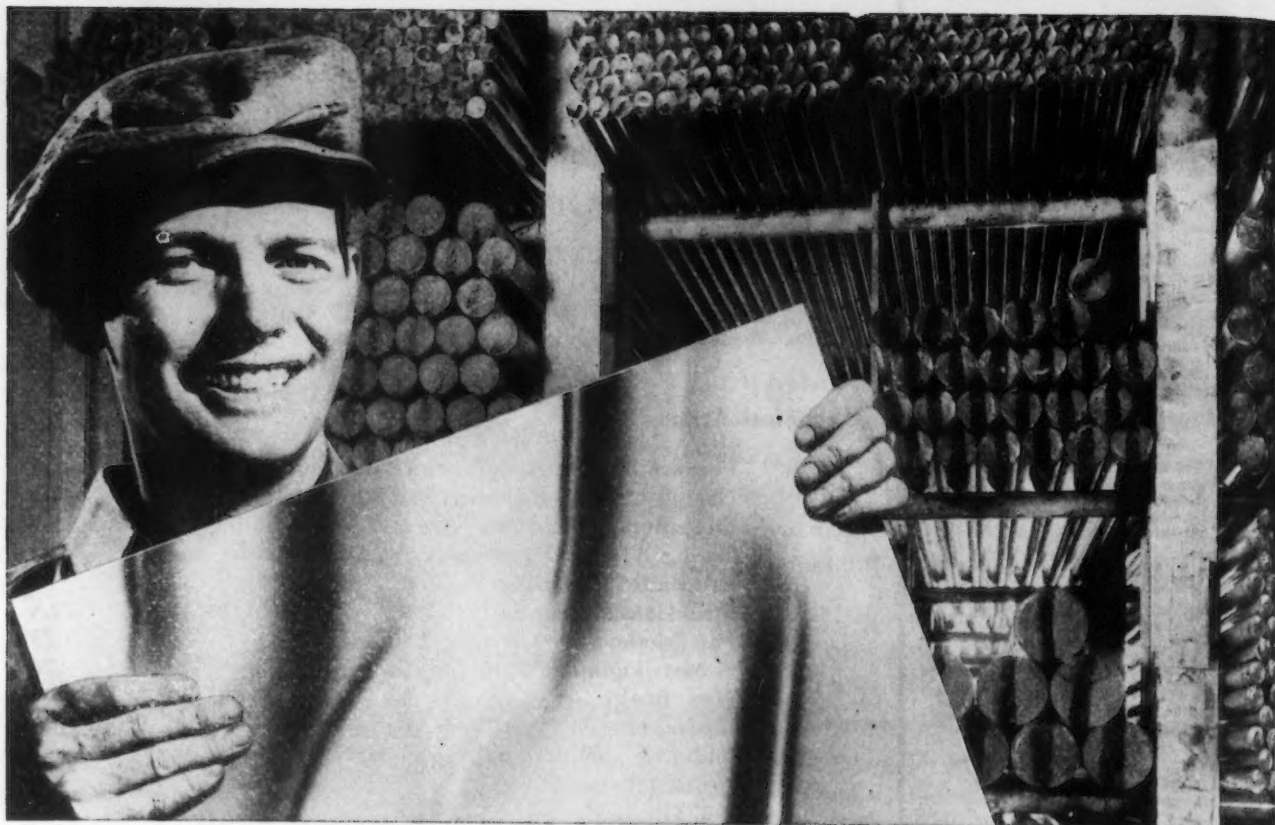
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Another Deal

CAMILLE GUTT, the Belgian who is head of the International Monetary Fund, has just returned from a successful trip to South Africa. Some weeks ago Nicholas Havenga, the Finance Minister of the Union of South Africa, announced a deal with a firm of London bullion brokers involving the sale of 100,000 ounces of gold at \$38.20 an ounce. M. Gutt has apparently persuaded the South African government to make no further deals of this kind and to sell the gold of the Rand hereafter at \$35 to the American Treasury.

There is more here than meets the eye. Gold production equals 15 per cent of national income of South Africa. It is probably no exaggeration to say that gold mining is to South Africa what the steel and automobile industries combined are to the United States. It would seem that the Union was entirely within its sovereign rights in selling its gold to bullion brokers in London, to free gold market traders in Tangiers, to peasant hoarders in France, to jewelry artisans, or the Treasury of the United States—in short, wherever it could get the best price.

By what manner of logic or pressure could an independent nation be forced to compromise its apparent interests and yield to the impudent dictation of a distant international bureaucrat operating in an alien capital seven thousand miles away?

A little background is necessary. The International Monetary Fund is one of the twins spawned at the Bretton Woods Conference at the end of the war. It was described as an effort to stabilize currencies and provide orderly foreign exchange markets in the post war period.

One of the undisclosed purposes of this scheme was to sterilize gold and deprive it of the basic role which it had played historically in determining the value of money. To this end ingeniously contrived arrangements were perfected which would channel all gold into the United States Treasury at a fixed price of \$35 an ounce until such time when the metal could be openly demonetized.

In selling gold at premium prices under conditions which permitted private individuals to acquire it, South Africa was jeopardizing the success of this sinister conspiracy. An open market price for gold in excess of the dictated \$35 price measures the depreciation of the American dollar in terms of gold. It calls striking attention to the failure of the ambitious money managers who comprise the "brains" of the Fund, the Federal Reserve Board and the United States Treasury.

This still does not answer the question how Havenga was induced to acquiesce in an arrangement which limited the market for his country's principal product and reduced the price which he might otherwise have obtained for his country's gold. The answer is probably to be found in arrangements, to be disclosed subsequently, which of course "will have no relation whatsoever" to the discussion between Messrs. Havenga and Gutt.

We predict that the Union of South Africa will shortly receive a substantial dollar credit from the Fund or the Export-Import Bank. Under any other circumstances this would be described properly as bribery. The American taxpayer foots the bill to forge another link in the chain by which potential totalitarians seek to shackle him.

Joseph Stagg Lawrence



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- ▶ Nearly all the ore burden used today in Swedish blast furnaces consists of concentrates in sintered form, a situation which American furnace operators may someday face. One Swedish furnace operator reports an iron production rate of 44.5 net tons per 1000 cu ft of working volume in a comparatively small furnace.
- ▶ Increasing expenditures of public funds in the construction field bid fair to hold 1949 dollar volume of building activity at or near last year's figure of \$18.8 billion—in spite of a slip off in private industrial and commercial projects. Thus the shifting building picture is brighter than government forecasts last December indicated.
- ▶ A maker of heavy durable equipment is considering electrolytic tinning of pistons to prevent wearing of basic metal surfaces during the initial stage of operation. If successful this will mean that cylinders will be tighter and leakage held to a minimum. Idea is for the tin to wear off leaving a tight fit.
- ▶ Last year we exported \$12.6 billion of goods while importing only \$7 billion. Our ships are leaving port heavily loaded, but returning with half-empty holds. Under the old system of Mercantilism this would have been considered good. Today the feeling is growing that goods can be paid for only with goods.
- ▶ Cavitation problems in large hydraulic turbines have started extensive research to find a metal able to withstand this type of erosion. The result of one testing program indicates that aluminum bronzes has held up better. It is now believed that erosion due to cavitation may be caused by the atomic hydrogen developed in the water vapor.
- ▶ Government approval of scrap exports and its holdup on imports have injected a weak shot of optimism into some scrap sellers but won't cure the patient. The shots are too small and the serum too weak to overcome the effects of oversupply. The patient had been getting so much it was coming out his ears. He is still choking on what he has absorbed.
- ▶ Suggested as an effective means of making oxygen additions to the cupola is a small pipe no larger than 3/8-in. diam. Oxygen addition would be through a reducing valve at pressure limited to 5 psi max. Idea is that oxygen, being heavier than air, would fall into the blast stream, thus being intermixed.
- ▶ Railroad officials are privately burned up over the price of freight cars. The vice president of one major road recently insisted the roads would buy more cars if prices were more realistic. Other railroad men say less revenue is the thing to watch in the decline of freight car buying.
- ▶ Radioactive chemicals are being used to test the effectiveness of detergents as metal cleaners. Method utilizes C14, an atomic energy by-product which emits beta rays, or electrons. Developing company says it can detect traces of soil beyond the sensitivity of even the most refined of present methods which depend on physical measurement.
- ▶ With much of Europe cut off as an export market due to the operation of ECA, aluminum producers find the Philippines, the Caribbean area and the Middle East including Israel the most active foreign buying markets. These markets all have dollars available.
- ▶ The trend in the steel industry is toward use of less coal per ton of steel produced. Many years ago 3 tons of bituminous coal were used per ton of ingot output. Metallurgical process and boiler improvements have cut this to about 1.35 tons. Modernization programs now underway may bring this down to 1 ton of coal per ton of ingot output.
- ▶ Use of a built-in, high-frequency wheelhead for highspeed internal grinding eliminates vibration caused by belts and sheaves, resulting in a better finish when using the same grade of wheel. It has been found that critical speeds in the wheel head are accentuated from a belt drive and vibrations from frequency harmonics may more easily be eliminated by a built-in unit.
- ▶ It may not be new, but it isn't general, for transparent plastic to be used as a safety shield in drill press operations. One firm which makes consumer goods from steel has made it impossible for clothes, hands or arms to be caught in drill press operations by using a circular shield on all drill press operations—even on an assembly lines.
- ▶ Cents per hour increases in wages demanded by unions in recent years had been generally welcomed by management as a less costly method of raising wages. Now some managements have become skeptical of this type wage action as having had a disruptive effect on moral of skilled workers. Future negotiations might include insistence on differentials between job classifications.

Furnace Brazing Aluminum

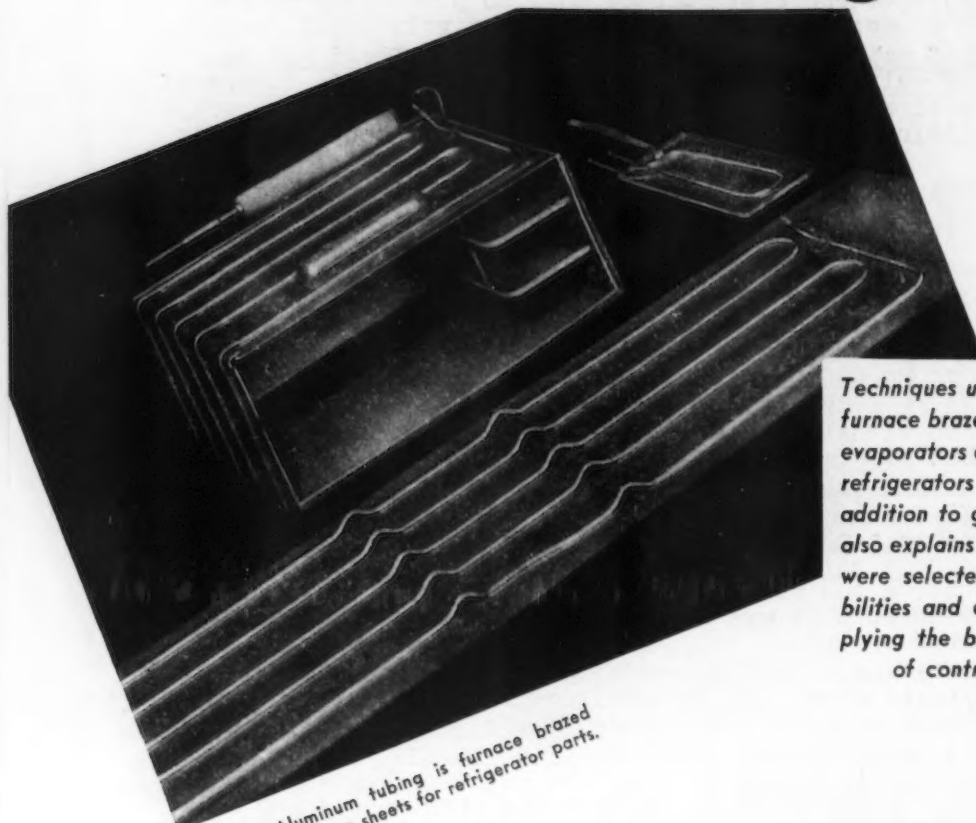


FIG. 1—Aluminum tubing is furnace brazed to flat aluminum sheets for refrigerator parts.

Techniques used in the volume production of furnace brazed aluminum assemblies for liners, evaporators and shelves for home freezers and refrigerators are described in this article. In addition to giving operating data, the author also explains why aluminum brazed assemblies were selected in preference to other possibilities and discusses various methods of applying the brazing alloy and the importance of controlling furnace temperature.

IN the manufacture of liners, evaporators and shelves for home freezers and two-temperature refrigerators, a fabricating method had to be developed that would meet the production requirements as well as certain physical requirements. Furnace aluminum brazing proved most satisfactory because of its good heat conductivity, the high production possibilities and because, by anodizing it would give highly satisfactory corrosion characteristics.

Prior to deciding upon the use of aluminum and its fabrication by brazing, copper sheet and tubing assemblies and galvanized sheet steel and copper tubing assemblies, both attached with soft solder, were considered. While the copper sheet assembly was excellent from a heat conductivity standpoint, it proved an expensive manufacturing operation and did not lend itself to high production. It also presented a problem of finishing to give satisfactory corrosion protection. The galvanized sheet steel and copper tubing assembly had in its favor a cheap basic material. Heat transfer characteristics were not as good as copper and soldering still presented production limitations. Furthermore, a satisfactory finish for corrosion protection was a problem.

Essentially, continuous furnace brazing of the aluminum sub-assemblies as pertaining to the evaporators, liners, shelves and other refrigerator parts consists of attaching long continuous lengths of aluminum tubing to flat aluminum sheets. Several such assemblies are shown in fig. 1. A typical aluminum sheet used in the manufacture of one of these parts is 0.040x18x120 in. with 480 in. of $\frac{3}{8}$ in. diam, 0.035 in. walled aluminum tubing brazed to it.

The sheet and tubing used are in most cases 2S or 3S aluminum. The brazing material is standard brazing sheet, either Alcoa's 711 or 713. These are aluminum brazing alloys containing 5 and 7.5 pct silicon. The brazing sheet is supplied either as clad material on sheet similar to that being brazed or separately as filler strip.

Two methods of assembly are used. Fig. 2 shows the use of a clad brazing sheet, one side coated, in the form of a small clip to hold the tubing in its proper location. This base metal of the clip may be made of 2S or 3S material which remains as part of the assembly. Also, the entire clip can be made of brazing alloy, which melts during the brazing operation after it has served

Refrigerator Parts

BY J. N. WOOLRICH

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Erie, Pa.*

its function of holding the tubing through assembly, fluxing and brazing operations.

Fig. 3 shows the use of a plain 2S or 3S sheet using a channel section of brazing alloy, which acts first as a means of holding and locating the tubing on the sheet. It then melts during the brazing operation and acts as the filler material.

Because of the small difference in melting points of 2S or 3S aluminum and the brazing

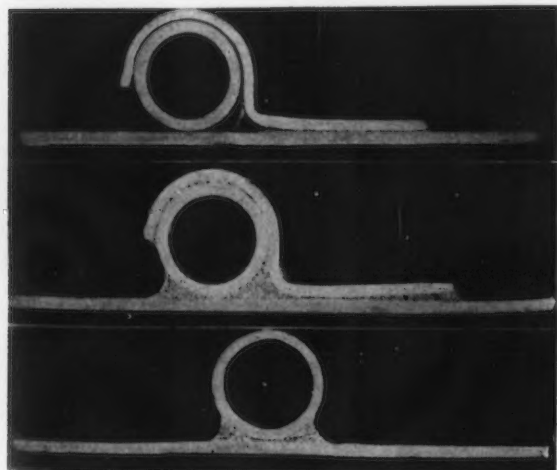
sheet, accurate and low differential furnace temperatures must be maintained. The volume of work, both in size and quantity, requires the use of continuous mesh belt furnaces. To maintain uniform temperatures, each critical heating section is controlled with a General Electric Reactrol control, maintaining a temperature differential of $\pm 2^\circ$ to 3°C at each control point. The furnace equipment is shown in fig. 4.

In a continuous mesh belt furnace and particularly in this work, where the belt load is more than the part load, the location of the control points in the furnace should be as close to the work as possible.

The usual temperatures for brazing the 5 pct silicon brazing sheet are from 1160° to 1185°F . The 7.5 pct silicon brazing sheet is usually brazed at temperatures between 1100° and 1140°F . Actual brazing temperature is determined by

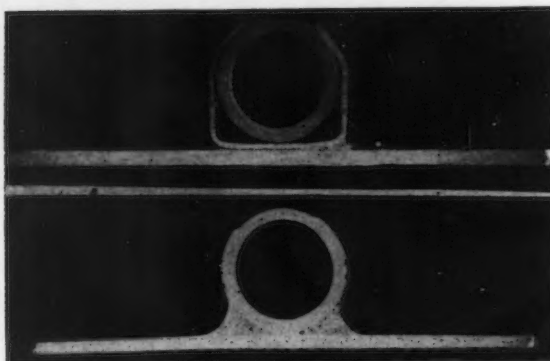
BELOW

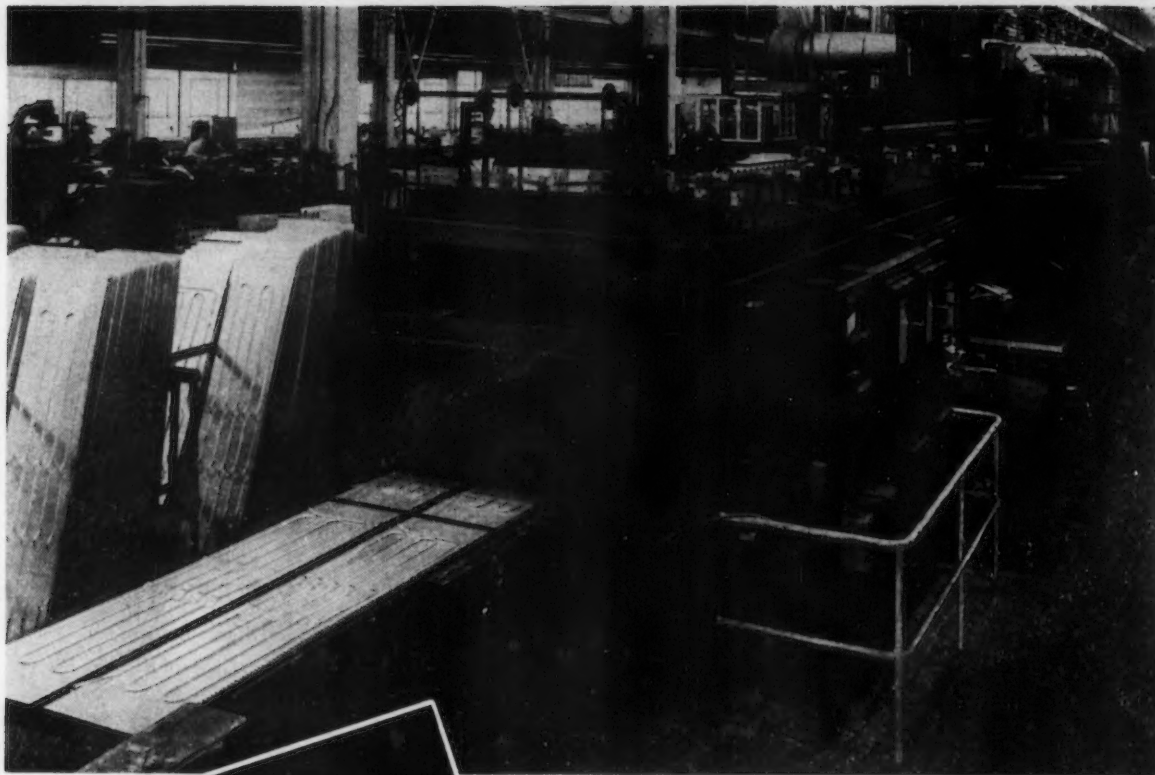
FIG. 3—The brazing alloy channel section, shown above, acts first as a means of holding and locating the tubing on the sheet and after melting as a filler.



ABOVE

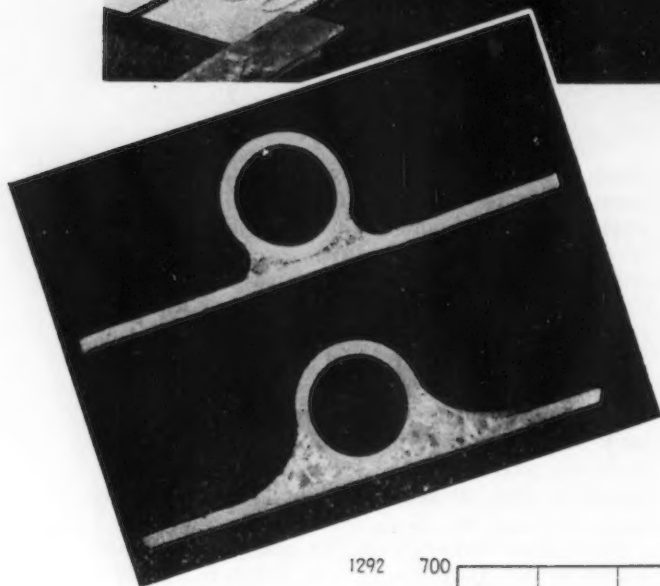
FIG. 2—Two methods used for brazing aluminum. At the top is shown a 2S or 3S clip clad on one side with the brazing alloy. The brazing alloy melts but the clip stays in place (center). At the bottom is shown a part brazed by using the brazing sheet only.





ABOVE

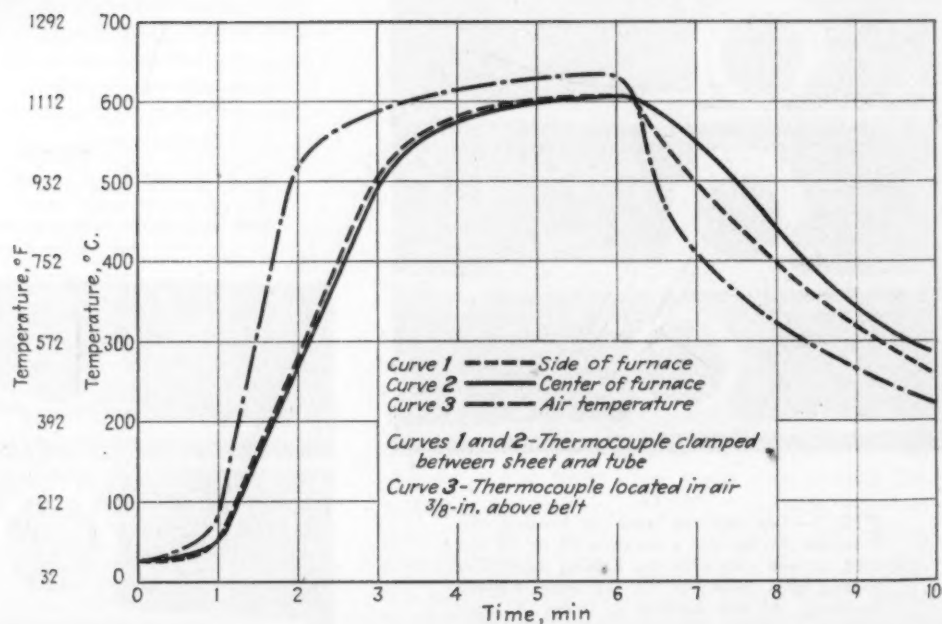
FIG. 4—The furnace equipment used in brazing these refrigerator parts utilizes a chain belt conveyor and requires precise temperature control.



LEFT

FIG. 5—The brazed section, shown above, was made with furnace temperature and time adjusted correctly, whereas that shown below was made with too much time at brazing temperature. It has washed about $\frac{1}{2}$ of the tube section into the filler.

FIG. 6 — Heating curves for aluminum sheet and tube assemblies in a continuous furnace brazing cycle.



means of a thermocouple attached directly to the parts being brazed. Other factors that determine the correct brazing temperature are the gage or thickness of the material, the chain speed, and whether large or small fillets are desired.

Chain speed is critical. Differences of 3 to 4 ipm with normal operation of 58 ipm can cause unbrazed or washed-through sections. If parts are held too long at brazing temperature, the molten brazing alloy will wash through the thin-walled sections.

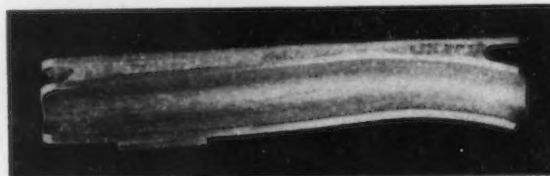
The brazed section, shown at the top of fig. 5, is one where temperature and time have been adjusted correctly. The bottom view shows a brazed section where too much time at brazing

of an 80 pct nickel-20 pct chromium alloy. While belt life and heating element life are relatively satisfactory, they are not comparable with what are obtained in similar furnaces used in other work, but operating at approximately the same or higher temperatures.

While intimate contact is preferable between sections to be brazed, gaps of as much as 1/16 in. have been brazed with satisfactory fillets, as shown in fig. 7.

Cleanliness and freedom from oil are desired, but as-rolled commercial quality sheets and tubes have been satisfactorily brazed. On parts that are not chemically clean, the addition of a wetting agent to the aqueous solution of the flux is

FIG. 7—While contact between the sections to be brazed is desirable, gaps of as much as 1/16 in. have been brazed with sheet fillets as shown here.



temperature caused the brazing alloy to wash approximately half of the wrought tube section into the casting fillet. Depending on the length of furnace, it requires from 5 to 7 min to bring the sections up to brazing temperature. The parts are held at brazing temperature from 1 to 1½ min. Heating curves for aluminum sheet and tube assemblies in one furnace now in production are shown in fig. 6.

This furnace has three 8 ft heating zones, the first under magnetic control and the other two under control of a Reactrol unit. Temperature control thermocouples are located 3 in. above the belt and set at 640°C or 1184°F. The 10 ft cooling chamber has a water cooled jacket and the 30 in. wide mesh belt is driven at a speed of 58 ipm. Full furnace load output is 110 brazed assemblies or 460 lb of aluminum per hr.

The flux used for brazing is a patented chloride-fluoride mixture and is quite active on furnace parts. Mesh belts and heating elements are made

beneficial.

The flux as it leaves the furnace is quite hygroscopic and corrosive. It appears desirable to remove the flux within 5 min after the assembly leaves the brazing operation and preferably before cooling.

The parts are passed through a three stage pressure washer. The first stage uses boiling water and removes the majority of the flux. The second stage is a boiling water rinse, and the third is a hot air blow off.

After going through the pressure washer, the parts are immersed for 2 to 3 min in a solution of 1 to 3 oz of alkali cleaner at 160°F, followed by a water rinse. It is then given a 15 pct nitric acid dip followed by a cold and hot water rinse (160°F) and blown dry with air. This finishes the brazing operation.

After forming and assembling, the liner or evaporator is cleaned to give a uniform surface, free of scratches or stains. It is then anodized (sulfuric) for corrosion resistance.

Adding Oxygen to the Cupola Blast

RUNNING a small pipe no larger than 3/8-in. diam, to the top of each tuyere, each pipe being equipped with a small valve, was suggested as an effective method of making oxygen additions to the cupola in a paper presented at a meeting of the Institute of British Foundrymen and reported in the March 31 issue of *Foundry Trade Journal* (London).

With an arrangement of this type, the oxygen, being heavier than air, would fall into the blast stream thus being intermixed. The oxygen addition would be through a reducing valve which would limit the pressure to 5 psi max. The author of the paper, J. Blakiston, thought it would be dangerous to add the oxygen to the blast main, and in addition would not give the desired degree of control of each tuyere. Designing a cupola

for continuous oxygen addition would probably need a much smaller stack diameter and lower air pressure for rather large production. Probably a much more expensive type refractory would be used, backed up by water cooling. It is possible, Blakiston said, that the lining consumption in this type of furnace might be less than that usually experienced on the standard cupola on a per ton output basis.

Discussion of the paper raised the point that the stack height in a cupola using oxygen enriched blast would be a very important factor for, with the increased melting speed, metal would pass down the stack at a faster rate than it could absorb the heat, unless this design factor was taken into consideration.

Gaging 125 Valve T



F IG. 1—Tappets are pushed by hand from the bench in right foreground into the gaging machine. Rejects and tappets of certain sorted lengths are ejected into boxes in front of the machine.

By HERBERT CHASE

New York

SINCE the valve tappets, called valve push rod bodies by Ford Motor Co., are produced and machined at rates exceeding 2000 an hr* and involve holding several dimensions within close limits, production gaging of these parts presents a problem. Hand gaging would require too many people and involve human errors that could not be tolerated even if costs were not excessive.

This made automatic mechanical means of doing the job essential, and three machines, one of which is here described, were designed and built to do the job and keep step with production. These machines are in constant use at the Ford Rouge plant and each machine gages tappets at the rate of 42 per min or 2520 per hr. The capacity of these machines is sufficient to handle production of 46,000 tappets per 8 hr shift. Besides gaging, the machine checks hard-

* "Machining Valve Tappets at 100 per Min," by Vincent Trolley, THE IRON AGE, Feb. 3, 1949, p. 110.

ness at one point, rejects parts outside limits, and sorts acceptable parts into five lengths in increments of 0.001 in. for later selective assembly.

Prior to this mechanical inspection, tappets are visually inspected, to eliminate those hav-

ing visual defects, as the parts pass along a belt on which all save those rejected reach the bench at right in fig. 1. At this bench the parts are fed manually through a channel to the machine where a chain conveyer feeds the tappets, domed end up, into a position where a reciprocating plunger moves the tappets to the first station.

There, the parts come to rest under a scleroscope arranged to drop a jewel tipped hammer down a glass tube where the weight strikes the flat at the center of the dome. If the part is hard enough, the hammer rebounds above a height corresponding to minimum hardness. If not hard enough, the rebound is less and the weight does not interrupt a light beam focused on a photoelectric cell. This results in tripping a solenoid that rejects the part at the next indexing. The cell light source and Scleroscope are seen in fig. 1 to the right of a transparent cover, under which gaging stations appear.

Tappets are next turned with axis horizontal and move to remaining stations along a horizontal V track by a reciprocating indexing bar. At each remaining gaging station, there is a gaging head and all these heads are raised by cams each time that indexing is done. When raised, the heads clear the work and are inoperative.

e Tappets Per Minute



Coupled to the high speed manufacturing setup for valve push rod bodies, described in *THE IRON AGE*, Feb. 3, 1949, automatic gaging equipment keeps pace with production. Dome hardness of the tappet is checked as described in this article along with squareness of the top, three diameters and the length. Offsize parts are rejected and others are sorted to length.

FIG. 2—This close-up of right end of the gaging machine shows at left center the station for gaging squareness of flat on the domed end of tappets. Equipment at the Scleroscope station was not in place when this photo was taken.



Immediately after each indexing, the heads are lowered to a fixed position where gaging points contact the work.

Movable gaging points are on the short arms of vertical levers that rock about horizontal pivots in ball bearings. At the top of the longer lever arms are electrical contacts that move $3\frac{3}{4}$ times as far as the gaging contacts. Fixed electrical contacts are arranged on screws that provide for micrometer adjustment. In most cases, the fixed electrical contacts are so set that if the dimension or dimensions being gaged are outside of limits the part will be rejected at the next or second indexing thereafter by means

of a kickout solenoid whose operation is controlled through relays by the electrical contacts at the top of the levers.

With this arrangement, parts that are under minimum dimensions fall in a box so marked and have to be scrapped. Parts over maximum dimensions are discharged into another box and are salvaged by regrinding. A similar arrangement is used at the two final stations to sort by length increments, as later described. Opposite discharge stations are chutes down which the tappets ejected slide into rubber lined boxes appropriately marked.

After hardness checking, tappets arrive at

the first gaging station where the flat on the domed end is checked for squareness with the cylindrical surface. This station is shown with cover removed at left of fig. 2 and in the drawing fig. 3. While at this station, the part is rotated by rollers while resting in the hardened V guides, turning about the axis of the cylindrical surface. During this check, the tappet rests against a fixed stop *S*, fig. 3, at the center of the undomed end and a gaging contact *G* on the short end of the lever *L* rests eccentrically against the flat whose squareness is to be determined. A spring plunger *P* holds gaging contact *G* against this flat.

If the flat is not square, the lever will rock about its pivot *T* as the tappet is rotated and the upper end of the lever will move between the electric contacts *E*. These are so set that if the gaging contact *G* moves more than 0.0005 in., the part is rejected; but acceptable parts continue to the next gaging station where the outside diameter is checked at points near each end of the cylindrical surface. If either of these diameters exceeds 0.9997 in. or is below 0.9991 in., the tappet is rejected. Those oversize are reground.

Accepted tappets are advanced to the third gaging station where the outside diameter is checked at a point midway between the ends. This diameter, in combination with the two measured at the prior gaging station, determines whether sides are straight. If they are not, the part is rejected.

Length measurements are made at the next three gaging stations two of which are shown in fig. 4. In the first of these three gaging stations, the setup is somewhat similar to that in fig. 3, but the part remains fixed rather than being ro-

tated and the fixed gaging contact as well as the movable one are on the center line at each end of the tappet. The lever also has a fixed electrical contact and a movable one at the end of a leaf spring. These two contacts lie between the adjustable contacts and which are so set as to cause ejection of tappets at certain stations.

Tappet length must not exceed 1.725 in. or be less than 1.720 in. If outside these limits, the tappet is rejected at the first length station. Tappets within these limits are segregated into five lengths from 1.720 to 1.725 in. separated by 0.001 in. increments.

The first segregation is effected at the second length station, where the two outer limit lengths are separated. Those of other lengths continue to the third length station where the two inner limit lengths are segregated. Physical segregation occurs at kickout points following the two last stations, but the relays that control the kickout solenoids are controlled by contacts made at the length segregating stations.

Since tappets of mean standard length (1.722 to 1.723 in.) are not kicked out at any station unless other dimensions are outside limits, they continue through the machine and into cartons, holding one hundred each, placed at the end, under the hands shown in fig. 4. Actually 75 to 85 per cent come within mean limits. Other accepted lengths fall into boxes in the foreground of fig. 4 and are removed by hand to packing cartons correspondingly marked.

After covering, cartons are ready for transfer to the motor assembly line, where selective assembly with valves having corresponding variations in length, take place. Some cartons go to storage for shipment to parts depots.

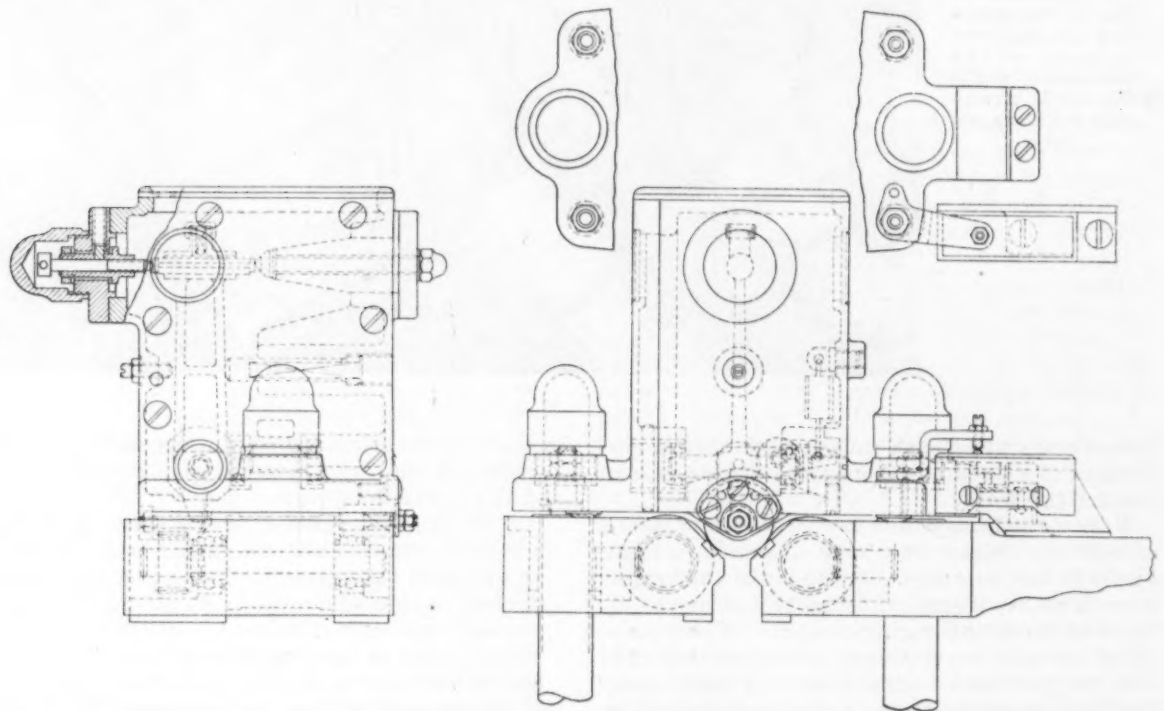


FIG. 3—Details of gaging elements at the station where squareness of the dome flat relative to the cylinder axis is checked as the tappet is rotated in the V guides.

FIG. 4—Two length segregating stations appear at right center of this illustration. Tappets above and below the mean length range fall into boxes in the center foreground. Those of mean length continue into the carton under packer's hands, top center.



It is essential in a machine of this type, where gaging heads are lifted between each indexing, that they seat properly against the base containing the work support when heads are returned to gaging position. Proper seating is insured in this case by spring plungers that pull each gaging head down on proper seats and rest buttons. As the heads reach the end of the down stroke, contact is made on special switches that establish continuity of electrical circuits between the gaging heads and the relays contained in the lower part of the machine. This construction avoids the use of flexible leads (pigtails) that would require frequent replacement.

Various safety means are provided and a light panel near the center of the machine indicates the location of trouble when the machine is stopped by one of the safety devices. A suitable unit is to be installed at the discharge end of the machine to stack pushrods in shipping boxes automatically.

This machine was designed originally for gaging a cast push rod having windows through which fingers were inserted to check wall thickness. Later the part was redesigned for gaging the drawn steel tappet whose open ends are closed by a cap welded in place. With this design, it is no longer necessary to check wall thickness.

Drop-Bottom Skid Bin Speeds Small Parts Handling

SMALL parts, such as castings and machined parts, can be emptied from skid bins all at once, rather than one at a time, by use of a hinged, drop-bottom bin illustrated in the accompanying photograph. The skid bin has a large eye welded to the end to which the bottom is hinged. To engage the eye, a hook is secured to the top of the mast of the truck which handles the bin. Forks lift the skid-bin to where the chain-manipulated hook engages the bin-eye and suspends the bin. The operator then lowers the forks of the truck, allowing the bottom of the bin to hinge downward and release the load. By regulating the angle to which the bin-bottom is lowered, the discharge rate is controlled.

When the bin is empty, the forks are raised, replacing the bottom in its normal position, and the truck-hook is disengaged from the bin-eye by the operator.



Use of a hinged drop bottom skid bin for unloading parts at work bench height without rehandling is illustrated here. Photo courtesy Yale & Towne Mfg. Co., Philadelphia.

Boring Tractor Housings

TWO boring jobs on HD-5 and HD-19 crawler tractors of Allis-Chalmers presented unusual problems that were solved by special boring machines designed and built by the W. F. and John Barnes Co., Rockford, Ill., and tooled by Gairing Tool Co., Detroit. The parts involved were the steering clutch housing for the lighter HD-5 tractor and the steering clutch and final drive housing of the HD-15 tractor.

The boring machine, shown in fig. 1, for the HD-15 steering clutch housing has three spindle work heads on each end; five spindle heads on the rear; and a single spindle on the front; thus approaching the work from all four sides simultaneously. The boring bars are supported by roller bearings in the quills and the quills are piloted in hardened bushings. End bars are supported both inside and outside of the housing by an overarm which swings into the case after it has been mounted in the fixture. All drilling and tapping on the outside of the case is done before boring. Two $\frac{7}{8}$ -in. drilled and reamed holes are used for locating in the boring fixture. Dowel pin locaters make it easy to duplicate micrometer lengths from positive stops.

A point of interest on this boring job is that bores on the outside of the housing are smaller than certain bores on interior parts. This necessitates boring the outside hole and, with the boring bar through the outside hole, changing tools for the inside cut. Two of the rear head spindles are fed out on an eccentric facing both sides of the housing simultaneously. Two other spindles enter the housing through previously bored holes and backface tools are installed inside of the house. Backfacing is done by reversing the feeding head direction.

The machine bores 27 holes and finishes 12 faces. It removes about 15 lb of metal with a cycle time of 80 min, floor to floor.

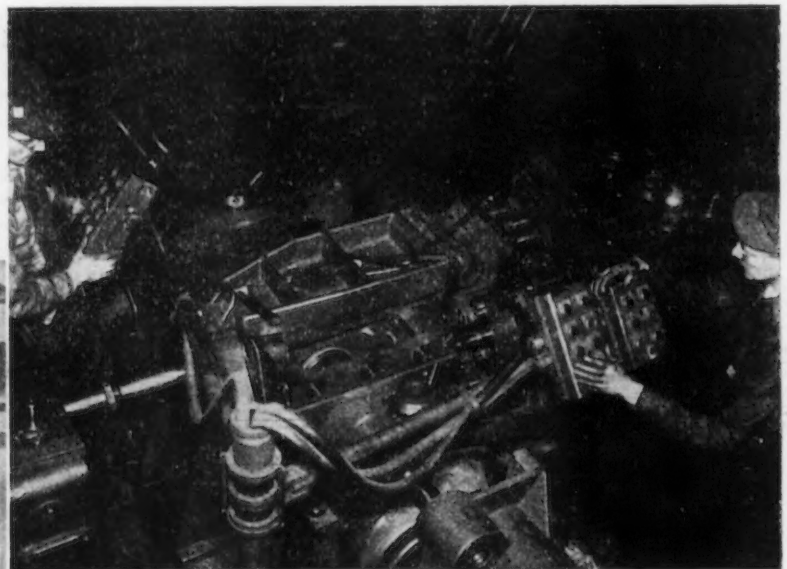
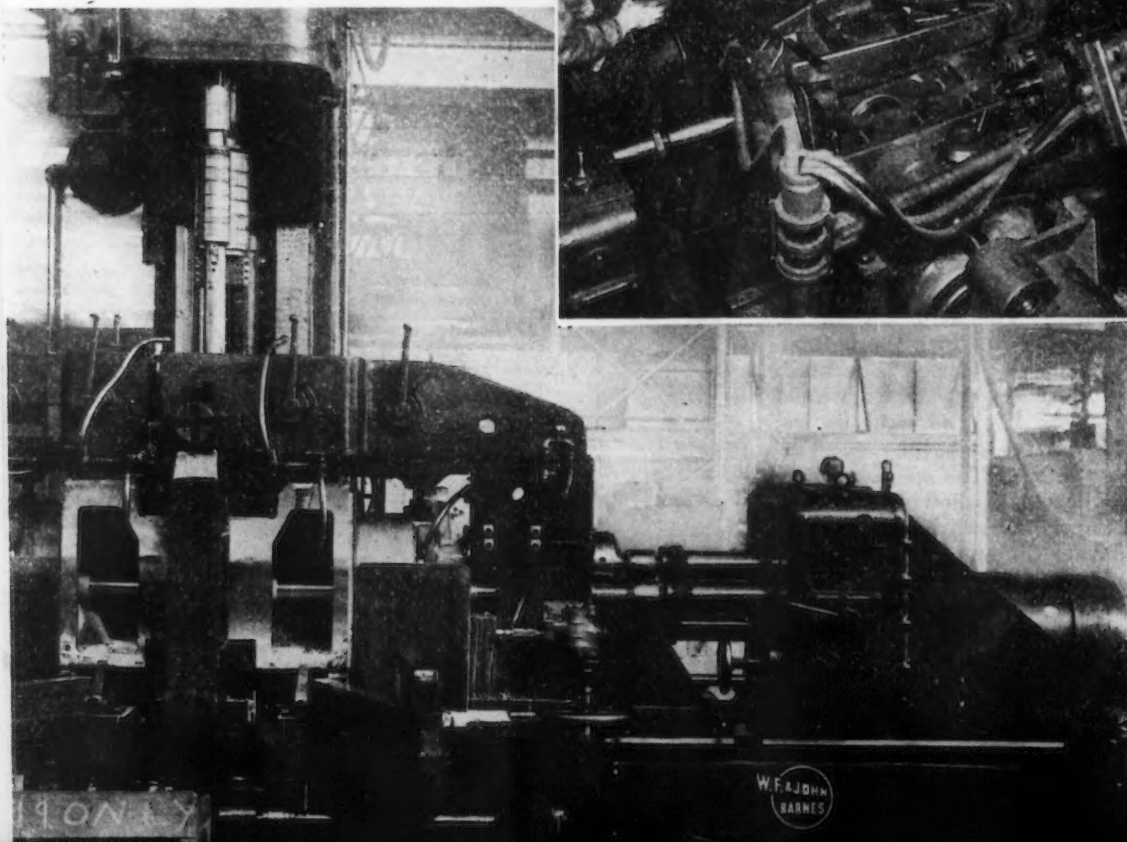
The machine used for boring the steering clutch and final drive housing of the HD-19 tractor has eight spindles, three on each end and a two spindle vertical head. Two stub bars on either end and the vertical bars are supported by roller bearing mounted quills that are piloted in hardened steel bushings. An 11 ft bar on either end reaches through the housing and is piloted on each end and the center of the fixture

RIGHT

FIG. 1—This four-way boring machine is used to bore the steering clutch housing of the Allis-Chalmers HD-5 tractor. Because bored holes inside the case are larger than those on the outside wall, tools have to be changed within the housing itself.

BELOW

FIG. 2—Boring on the HD-19 steering and final drive housing is done from both ends and the top. By an indexing arrangement, boring bars are always in such a rest position that the tools can be changed inside the housing.



W. F. & J. BARNES

in bronze bushings. This arm is held by an arm that swings into position by an air motor after the housing has been loaded into the fixture.

The machine, shown in fig. 2, makes 27 bores to precision size and finishes eight faces. The assembly weighs 3000 lb. Two holes, drilled and reamed in the housing are used to locate the part in the fixture. The case is set on parallels outside the machine and drawn into boring position by a hydraulic cylinder.

When in position, electrically operated dowel pins move into the locating holes and hold the

case in proper boring position. Some bores in the case are larger than bores on the outer walls, making necessary a tool change inside the case.

Boring heads on each end index automatically before entering working position and stop automatically at the same indexing position on return. This facilitates tool removal and replacement, and it would otherwise be impossible to change the tools inside the case.

About 32 lb of metal are moved from the case with three passes of each of the three heads. The cycle time is 2.9 hr, floor to floor.

Salt-Bath Chromizing

CHROMIZING by immersion of ferrous metals in fused salt baths containing from 5 to 30 wt pct CrCl_2 has been found to compare favorably with conventional pack methods both in overall cost and in rate of case formation.

The salt-bath process was used in experimental work in Germany during the war^{1,2,3} and the obvious advantages—latitude in CrCl_2 concentration during treatment, elimination of packing and unloading operations, and furnace heating and cooling, and the possibility of chromizing simultaneously articles requiring different periods of treatment—prompted a more thorough investigation of the feasibility of the process. This investigation was carried out at Battelle Memorial Institute under the sponsorship of the Army Air Forces' Air Materiel Command.

Like all pack processes except those depending solely on diffusion of metallic chromium, salt-bath chromizing is a displacement process in which at the surface of the chromized part, CrCl_2

This report is an abstract of the paper "Salt-Bath Chromizing" by I. E. Campbell, V. D. Barth, R. F. Hoeckelman and B. W. Gonser of Battelle Memorial Institute, Columbus, Ohio, presented at the 95th meeting of the Electrochemical Society in Philadelphia

reacts with iron to form a chromium-iron alloy and FeCl_2 . The surface of the part, as ordinarily prepared, is of the order of 40 to 70 pct Cr. The concentration gradient beneath the surface drops to about 13 pct Cr at the interface between the case and base metal.

Rate of case formation depends upon the exchange reaction and the interdiffusion of chro-

mium and iron. In salt-bath chromizing with a high chromous-ion activity, the exchange process can be assumed to be instantaneous with the result that the diffusion process is the limiting factor. Since diffusion rate is an exponential function of temperature, the rate of case formation increases rapidly with a small temperature increase.

The salt-bath composition used in most of the work consisted of the following mixture: 30 pct CrCl_2 , 49 pct BaCl_2 , 21 pct NaCl and sufficient Cr flake to cover the crucible bottom. The CrCl_2 may be prepared in situ by chromium metal reduction of CrCl_3 . An argon atmosphere was provided to shield the bath against air, since the CrCl_2 fraction is sensitive to oxidation. The comparative case formation determinations in table I

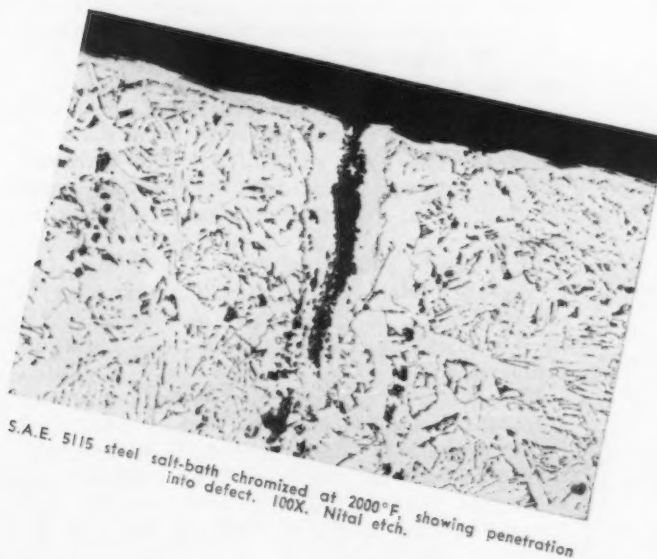


TABLE I

Comparison of Case Thicknesses by Pack and by Salt-Bath Methods

Ferrous Material	Pack Method, 6 hr at 1832°F	Salt-Bath Method at Indicated Time and Temperature
Armco Iron.....	0.0007 in.	0.0020 in. (6 hr, 1832°F)
Cast Iron.....	0.0006	0.0009 in. (3 hr, 1900°F)
S.A.E. 1045.....	0.0005	0.0011 in. (6 hr, 2000°F)
S.A.E. 2315.....	0.0004	0.0012 in. (6 hr, 2000°F)
S.A.E. 3140.....	0.0006	0.0012 in. (6 hr, 2000°F)

were made in this bath and with this atmosphere. However, variations were made on both bath composition and atmosphere to estimate results on chromizing. Although an enclosed atmosphere top was employed, it is possible that some kind of floating cover might be satisfactory in production-scale work.

Several attempts to chromize in the absence of chromium metal in the charge were unsuccessful. This was true even of runs in which a single specimen was treated in a virgin bath. Another variation investigated on the possibility of more economic operation was the substitution of CaF_2 and NaF for the more volatile barium and sodium chlorides. This fluoride bath was satisfactory in fluidity and case structures obtained, and salt vaporization was reduced; however, poor rinsability of adhering salt after chromizing was encountered.

To establish permissible variations in CrCl_2 concentration, a series of runs were made in which the CrCl_2 was varied from 50 to 2 wt pct. A 5-pct bath appeared to be the practical lower limit. A 10 to 20-pct bath yielded satisfactory results.

Attempts to substitute CrCl_3 for CrCl_2 failed in repeated trials, severe corrosion occurring in every instance. In practice, the maintenance of a fixed $\text{CrCl}_3:\text{CrCl}_2$ ratio would constitute a difficult problem.

Nitrogen and carbon dioxide atmospheres were successfully used. Good cases were also obtained in air where bath vapors were sufficiently undisturbed to provide a barrier at the bath surface. When air currents had free access to the bath surface, severe oxidation and vaporization occurred.

The laboratory chromizing furnace consisted essentially of a heated crucible with provisions for manipulation of specimens and maintenance of predetermined temperatures and atmospheres. Several runs were also made in an internally-heated type P Ajax electric salt-bath furnace equipped with a ceramic pot.

Successful chromizing was carried out on a variety of ferrous materials. Smooth, nonporous, deformable, HNO_3 -resistant cases were produced

at temperatures from 1750° to 2200°F in CrCl_2 concentrations of from 5 to 30 pct by wt, over 1 to 6-hr periods. Chromizing in the Ajax furnace was also satisfactory.

Penetration into recesses proved to be favorable, judging by the uniformity of the cases formed. This is illustrated in the accompanying photomicrograph, showing chromizing in a defect.

The pack method was also used to obtain comparative cases, as indicated in table I. The rate of case formation in the salt-bath was found to be equal to, or greater than, that obtained with the various pack methods at corresponding temperatures.

In evaluating the process from the standpoint of cost, the salt-bath method compares favorably with other chromizing processes. The bath can be operated in a more or less continuous manner so that packing, furnace heating, treatment, furnace cooling and unloading cycles are avoided. Although chromium metal was used in producing CrCl_3 on this project, the salt can be made more cheaply from ferrochromium^{6,7}. Operation at lower temperatures for shorter times is possible for much work.

Effectiveness of the process is dependent to a considerable extent, as in other chromizing methods, on choice of material. Deeper penetration at lower temperatures requires the selection of lower carbon steels⁸ and the presence of silicon appears to increase the diffusion rate.

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- ⁶ Brit. Pat. 276,120 (1927), "Improvements in or Relating to the Production of Chromium Compounds."
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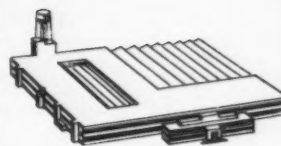
A report by **THE IRON AGE** *to the metalworking industry*

STEEL CONSUMPTION IN 1948

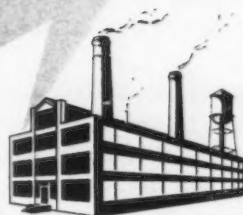
... by states

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... by major products



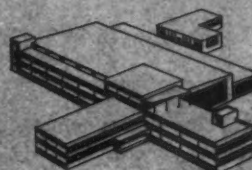
MICHIGAN
15.4% of U. S. Total



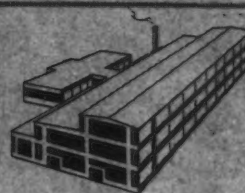
ILLINOIS
12.8% of U. S. Total



OHIO
12.3% of U. S. Total



PENNSYLVANIA
12.0% of U. S. Total



NEW YORK
7.0% of U. S. Total

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By **Oliver Johnson**
Research Director,
The Iron Age



A detailed study of the geographic pattern of the distribution of finished steel has been completed by THE IRON AGE and is presented herewith. Data developed in this study cover the use of 10 classifications of finished steel in 48 state areas and 68 industrial areas.

This study shows that 46,000,000 tons of finished steel was used directly in the metalworking industry in 1948 out of a total of 66,000,000 tons shipped by steel mills. The balance went for uses outside the metalworking industry. Michigan, Illinois, Ohio and Pennsylvania were, in that order, the largest consumers, while in industrial areas Detroit, Chicago, Milwaukee and Cleveland were the four largest users. The accompanying tables and graphs show in detail the information developed in this study.

There has been a long felt need of such steel distribution data, but the scope of the undertaking, plus the need for basic plant information of highest calibre has in the past discouraged its collection. However,

The questionnaire asked for the total rolled and drawn steel used by each plant in 10 classifications. Steel castings and scrap were not included. Hot rolled bars and billets used by forging companies were included, but forgings purchased by their customers were excluded to avoid duplication. Other semi-finished components such as stampings, weldments, springs, etc., were not included in the reports from plants purchasing such, but sheets, strip, plates, shapes and wire utilized in making such components were included by those plants actually producing the components.

The survey was confined to the metalworking industry—plants primarily engaged in manufacturing products and sub-assemblies from metal.

The considerable amount of steel which goes directly to its end use outside the metalworking industry is not represented in this report. Examples of this distribution are export steel, railroad maintenance of way material, oil industry pipe, some field construction

STEEL CONSUMPTION IN OHIO IN 1948

The five leading forms of steel consumed in Ohio, one of the most important steel using areas in the U. S., is shown here. Detailed data are given in the tabulation on the facing page.

% of U. S. Total 0 5 10 15 20 25



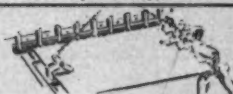
Hot Rolled Sheets & Strip
Including Galvanized - 13.7%



Cold Rolled Sheets
& Strip - 12.9%



Hot Rolled Bars - 12.4%



Plates - 9.7%



Wire & Wire Rods - 15.3%

with the development of THE IRON AGE Basic Market Data (see issue of Jan. 6, 1949, p. 226), which comprises an original census of the nation's metalworking plants, the means for conducting such a study on a scientifically accurate basis became available, and the study was made.

For varied reasons, it was desirable to assemble information directly from the steel using plants. By means of mail questionnaires, supplemented by personal interviewing, a liberal sample of the geographic use of steel was obtained and was projected to the entire industry on the basis of data contained in THE IRON AGE Basic Market Data.

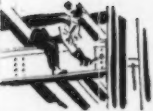





steel, material for direct use on farms and some steel bought by utilities and mines.

Reports were received from small, medium and large plants; the number of plant workers in the reporting plants totaled 1,630,000, equal to one-third the total workers in the industries covered. The amount of steel use accounted for in the reports amounted to 15,000,000 tons. This was approximately one-third of the 46,000,000 tons which the metalworking industry used in 1948. This correlation between the reported number of workers and the reported quantities of steel is proof that the sample was representative of the industry.

1948 Consumption of Rolled and Drawn Steel (all grades) by

STATE	Hot Rolled Sheets and Strip Including Galvanized	Cold Rolled Sheets and Strip	Tin and Terne Plate Black Plate	Plates	Structural Shapes	Hot Rolled Bars	Cold Finished Bars
ALABAMA	54,380	26,304	1,182	76,583	81,427	43,531	5,333
ARIZONA	3,814	1,863	51	4,798	13,347	4,155	276
ARKANSAS	3,369	2,716	2,129	2,373	5,215	2,147	356
CALIFORNIA	364,900	223,477	454,758	288,341	255,841	176,358	42,505
COLORADO	14,905	6,737	2,649	19,693	22,106	16,745	2,739
CONNECTICUT	251,832	266,159	16,781	79,467	25,047	190,101	81,203
DELAWARE	12,291	4,644	263	44,745	14,840	5,674	1,227
DIST. OF COL.	2,488	1,532	117	2,822	6,230	5,839	1,496
FLORIDA	18,000	8,207	53,422	13,681	14,129	6,705	1,018
GEORGIA	47,854	21,403	9,406	24,620	19,677	16,913	4,228
IDAHO	802	584	21	756	1,045	1,885	379
ILLINOIS	1,090,245	770,380	908,313	578,384	379,790	1,036,269	271,257
INDIANA	708,255	477,368	70,606	216,193	133,013	468,969	127,593
IOWA	129,149	50,894	3,889	61,812	55,675	119,554	27,456
KANSAS	25,028	13,537	619	32,061	30,271	24,188	4,425
KENTUCKY	77,224	56,836	46,078	32,214	26,394	44,733	9,479
LOUISIANA	32,790	8,550	50,083	24,939	19,039	8,657	1,382
MAINE	4,557	3,497	32,886	7,694	6,398	7,312	3,235
MARYLAND	150,304	92,957	264,050	64,232	25,347	26,020	9,386
MASSACHUSETTS	287,051	201,151	54,618	144,513	82,272	205,643	70,407
MICHIGAN	1,967,594	2,397,759	58,930	410,075	154,624	1,149,191	311,642
MINNESOTA	82,289	55,060	46,884	60,600	56,456	71,476	20,407
MISSISSIPPI	2,521	882	82	11,154	4,388	2,910	679
MISSOURI	198,432	135,880	76,154	110,180	61,719	89,947	25,146
MONTANA	1,153	135	8	2,826	1,673	1,081	111
NEBRASKA	29,828	11,367	858	16,043	25,840	18,722	3,706
NEVADA	104	7	1	501	159	110	10
NEW HAMPSHIRE	8,749	5,068	290	9,644	4,571	7,606	2,879
NEW JERSEY	325,447	237,507	312,480	176,543	110,974	188,917	56,211
NEW MEXICO	312	91	5	160	157	96	10
NEW YORK	681,742	501,092	352,484	440,221	236,621	441,253	143,341
NORTH CAROLINA	11,918	7,301	314	8,747	15,185	11,237	2,689
NORTH DAKOTA	802	290	10	1,486	4,495	1,374	10
OHIO	1,383,791	1,108,124	213,011	571,659	331,836	838,364	281,706
OKLAHOMA	19,775	5,941	360	51,975	49,116	23,717	2,879
OREGON	14,172	9,990	31,029	11,756	12,277	10,510	2,406
PENNSYLVANIA	997,057	672,793	352,875	1,065,941	584,863	850,001	119,706
RHODE ISLAND	23,839	28,100	21,266	9,868	6,084	43,610	16,341
SOUTH CAROLINA	2,235	1,387	59	7,577	3,850	1,378	50
SOUTH DAKOTA	2,266	870	31	929	998	1,421	10
TENNESSEE	63,538	55,286	10,347	55,590	37,739	26,879	6,206
TEXAS	99,257	34,005	133,994	108,383	111,537	97,149	10,406
UTAH	3,969	1,247	8,711	9,222	9,559	4,586	10
VERMONT	8,447	6,317	219	3,052	2,667	6,403	40
VIRGINIA	29,859	15,184	11,895	88,511	61,022	25,100	2,406
WASHINGTON	29,245	17,638	52,633	36,674	21,633	26,834	4,406
WEST VIRGINIA	46,859	42,293	71,146	33,745	23,049	19,641	3,406
WISCONSIN	803,297	370,022	51,508	863,866	155,846	386,286	100,706
WYOMING	339	364	14	138	94	430	10
NATIONAL TOTAL	10,118,074	7,960,796	3,779,519	5,886,987	3,306,155	6,757,627	1,789,106

awn Steel (all grades) by the Metalworking Industry

	Structural Shapes	Hot Rolled Bars	Cold Finished Bars	Pipe and Tubes	Wire and Wire Rods	Unclassified	TOTAL
							
	81,427	43,531	5,333	17,012	15,506	21,475	342,733
	13,347	4,155	276	1,240	549	2,115	32,208
	5,215	2,147	356	764	849	1,273	21,191
	255,841	176,358	42,505	88,203	94,214	106,951	2,095,548
	22,106	16,745	2,739	5,179	2,530	8,102	101,385
	25,067	190,101	81,203	65,817	165,607	52,660	1,194,694
	14,840	5,674	1,227	3,322	3,786	8,267	99,059
	6,230	5,839	1,496	834	318	1,498	23,174
	14,129	6,705	1,018	2,010	878	3,811	121,861
	19,677	16,913	4,228	7,901	10,625	7,476	170,103
	1,045	1,885	379	318	553	419	6,762
	379,790	1,036,269	271,257	177,755	376,463	317,029	5,905,885
	133,013	468,969	127,593	82,378	112,441	119,694	2,516,510
	55,675	119,554	27,456	22,094	23,623	31,046	525,192
	30,271	24,188	4,425	9,494	3,377	8,501	151,501
	26,394	44,733	9,474	15,588	10,083	29,398	348,022
	19,039	8,657	1,382	7,474	1,847	4,082	158,843
	6,398	7,312	3,235	2,495	4,472	1,412	73,958
	25,347	26,020	9,386	10,941	23,453	21,380	688,075
	82,272	205,643	70,403	53,247	134,943	81,390	1,315,231
STEEL	154,624	1,149,191	311,643	148,880	276,777	197,848	7,073,321
IN	56,456	71,476	20,402	20,089	17,970	22,177	453,403
	4,388	2,910	676	1,173	2,039	1,957	27,782
	61,719	89,947	25,144	39,497	51,286	35,135	823,374
The five	1,673	1,081	110	1,440	188	156	8,770
steel c	25,840	18,722	3,707	4,515	2,667	6,384	119,931
one of	159	110	17	164	10	41	1,114
steel u	4,571	7,606	2,876	1,801	11,683	1,850	54,138
U. S.,	110,974	188,917	56,213	82,529	120,480	73,609	1,684,699
tailed	157	96	16	31	21	43	932
the ta	236,621	441,253	143,345	115,378	142,992	177,228	3,232,356
facing	15,185	11,237	2,686	2,875	4,331	3,853	68,447
	4,495	1,374	45	187	143	771	9,603
	331,836	838,364	281,767	225,538	374,599	305,601	5,634,335
	49,116	23,717	2,802	15,448	2,751	9,791	181,676
	12,277	10,510	2,462	3,780	4,337	4,902	105,215
	584,863	850,001	119,763	218,713	269,582	367,066	5,498,654
	6,084	43,610	16,395	6,151	37,178	4,112	196,603
	3,850	1,378	559	769	1,010	1,203	20,027
	998	1,421	350	239	155	400	7,659
	37,739	26,879	6,244	20,317	10,567	17,002	303,509
	111,537	97,149	10,831	33,927	14,835	31,556	675,474
	9,559	4,586	508	3,366	1,024	1,674	43,866
	2,667	6,403	4,361	1,137	1,668	1,383	35,654
	61,022	25,100	2,022	8,579	5,680	12,822	260,674
	21,633	26,834	4,439	7,633	4,393	8,590	209,712
	23,049	19,641	3,584	9,797	5,201	10,027	265,342
	155,846	386,286	100,772	83,697	92,330	153,933	3,061,557
	94	430	110	87	86	122	1,784
	3,306,155	6,757,627	1,789,220	1,631,848	2,442,105	2,279,215	45,951,546

TOTAL

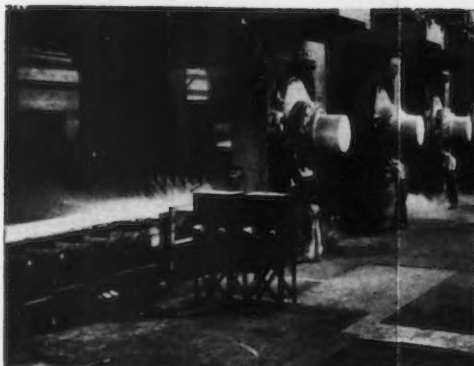
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a

Continuous hot
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production

b

Continuous cold
reduction mill



c

Electrolytic tin
plate uncoiler

d

Steel Plate mill

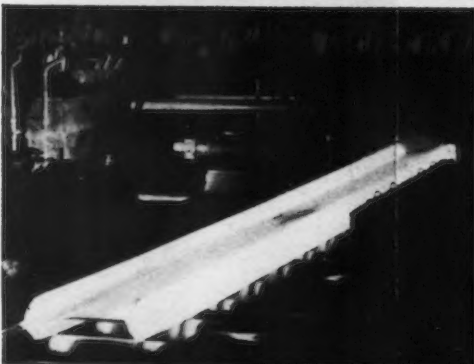


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Hot rolled bar
production

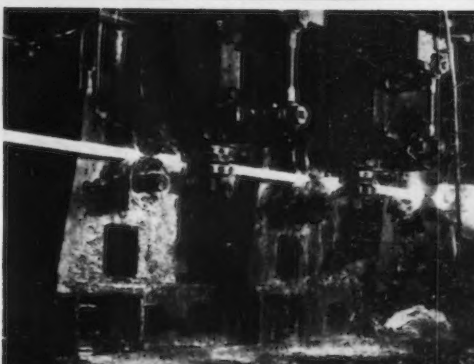


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Butt welded pipe
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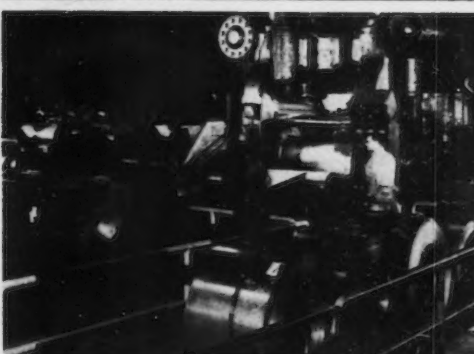
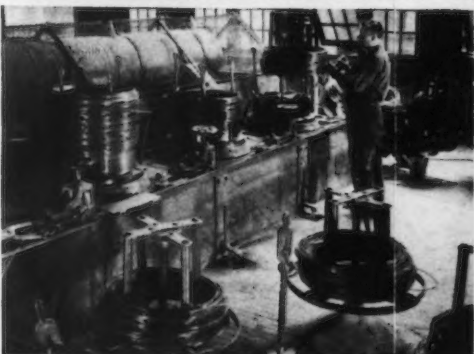


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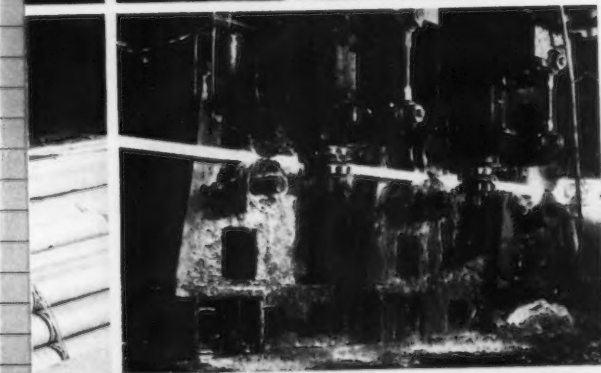
Wire draw benches

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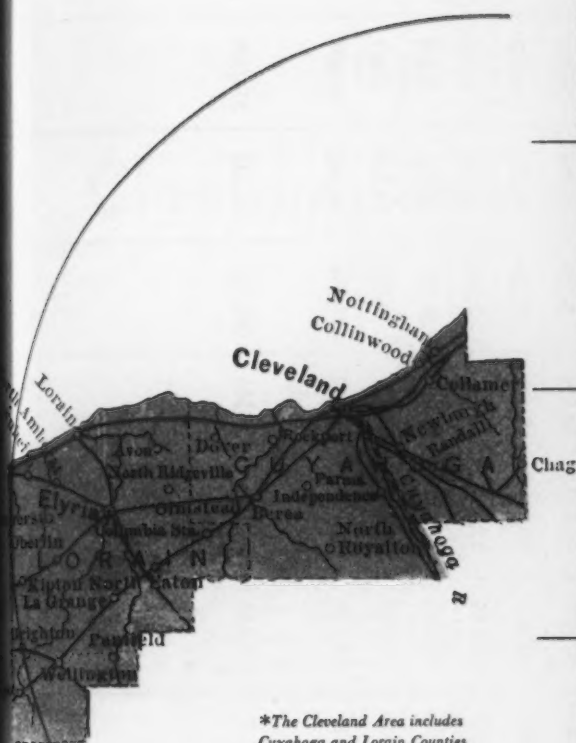
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THE 5 LEADING FORMS OF STEEL CONSUMED IN THE CLEVELAND* AREA DURING 1948



*The Cleveland Area includes Cuyahoga and Lorain Counties



% of State

**Hot Rolled Sheets
and Strip
Including Galvanized
29.0%**



**Hot Rolled Bars
44.4%**



**Cold Rolled Sheets
and Strip
25.9%**

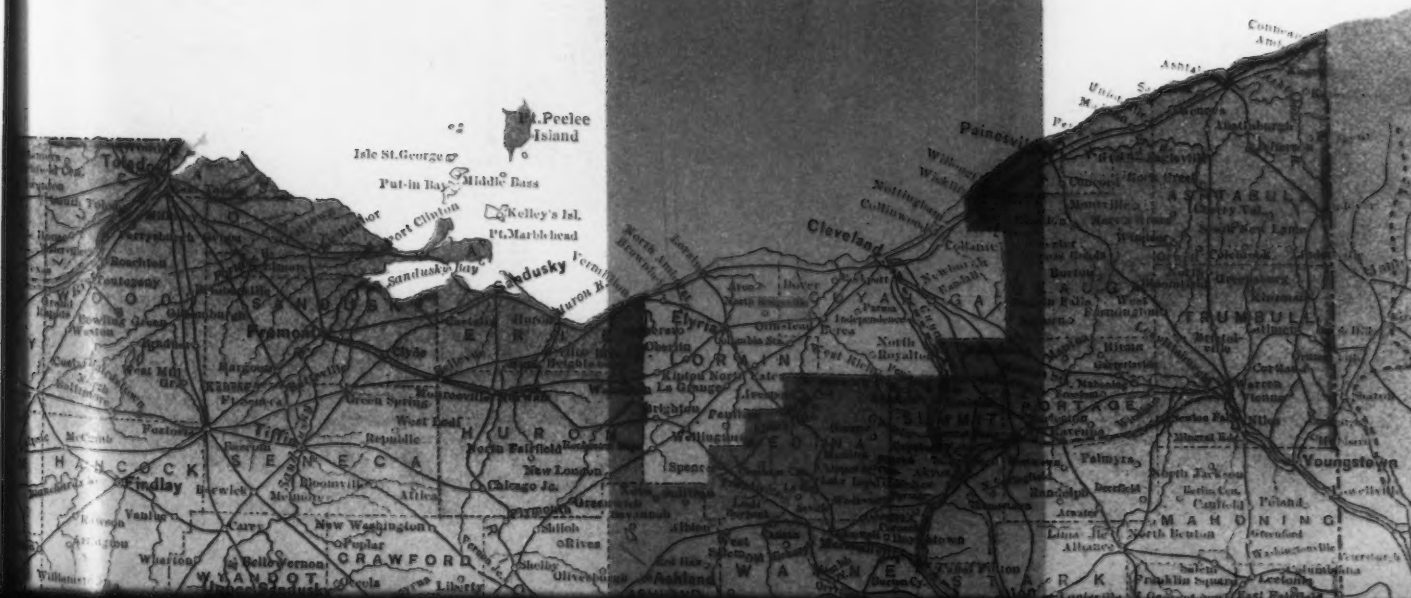


**Wire and Wire Rods
68.7%**



**Plates
28.0%**

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OHIO

1948 CONSUMPTION

OF ROLLED

AND DRAWN STEEL

(ALL GRADES)

BY

THE METALWORKING

INDUSTRY

PRESENTED BY

INDUSTRIAL AREAS

	AKRON	CANTON	CINCINNATI	CLEVELAND	COLUMBUS	DAYTON	MANSFIELD-MARION	TOLEDO	YOUNGSTOWN	OTHER OHIO	OHIO TOTAL
Hot Rolled Sheets & Strip Including Galvanized	32,166	64,376	123,447	402,035	59,913	163,005	51,034	168,872	142,978	175,965	1,383,791
Cold Rolled Sheets & Strip	13,220	76,448	103,446	287,237	50,355	141,208	73,354	120,184	80,248	162,424	1,108,124
Tin & Terne Plate Black Plate	1,729	23,250	101,275	20,607	6,787	18,452	1,079	4,559	6,202	29,071	213,011
Plates	68,605	32,042	62,217	160,101	27,579	42,150	20,144	30,292	52,282	76,247	571,459
Structural Shapes	21,289	19,372	27,161	106,212	21,579	19,099	13,104	14,066	50,987	38,967	331,836
Hot Rolled Bars	14,585	95,844	43,270	372,443	50,355	61,835	12,622	77,563	28,937	80,910	838,364
Cold Finished Bars	5,464	7,237	20,343	120,136	8,239	34,508	7,850	26,311	9,883	41,796	281,767
Pipe & Tubes	24,424	21,972	22,447	55,136	19,186	19,826	6,839	12,856	16,957	25,940	225,583
Wire & Wire Rods	2,721	20,323	16,887	257,454	19,274	14,752	5,426	8,479	7,311	21,972	374,599
Unclassified	6,888	49,758	20,861	110,114	10,902	20,870	6,146	25,978	23,538	30,546	305,601
Total	191,091	410,622	541,354	1,891,475	274,169	535,705	197,598	489,160	419,323	683,838	5,634,335

Typical of the data developed in this study is the use of steel in Ohio by industrial areas as shown in the accompanying chart. The definition of an industrial area as used in THE IRON AGE study is the same as that used by the Bureau of the Census—one or more counties within a state surrounding an important industrial city. Space limitations preclude the publication here of complete data on the 68 industrial areas embraced by the study, but this information will be made available, gratis, to IRON AGE readers upon request.

Fast Methods for Cleaning Bearings

By JOSEPH ALBIN
New York

RAPID techniques for cleaning bearings and other intricate parts through the use of high pressure sprays have been developed at the overhaul depots of American Airlines. Pressures from 75 to 120 psi have been found to dissolve, loosen and carry away grime on the parts in about half the time required with the 40 psi pressures previously prescribed. No damage to parts has been observed.

Standard spray guns, commercially known as engine cleaner siphon guns or Varsol spray guns, are used with Sinclair solvent, a cleaning fluid approximating Stoddard solution. The nozzle of the gun operates on the Venturi principle, solvent being aspirated through it by the



FIG. 1—Operator using high pressure atomized spray for cleaning bearings. Pressures above 75 psi have been found to reduce cleaning time substantially.

air blast, as shown in fig. 1. The guns are provided with a connection for rubber tubing which leads to the solvent supply. Air pressure is controlled by the valve on the gun. Nozzles for light, medium or heavy sprays are available, and in some models, the amount of material delivered can be governed by regulation of the nozzle at the end of the gun.

With these high pressure sprays, cleaning action of the solvent is considerably more efficient as the loosened grime is driven away rapidly by the heavy air stream, exposing surface as rapidly as the lubricant residues can be attacked.

Comparison figures illustrate the increased cleaning power. With a nozzle orifice diameter of 0.125 in. and air pressure of 40 psi, discharge of free air amounts to 12.4 cfm. At 90 psi pressure, the volume is slightly less than double this amount. For an orifice diameter of 0.250 in., the volume is roughly quadrupled. The higher pressure also brings forth a larger output of solvent with effective atomizing.

After deposits are removed, the operator turns off the fluid valve and dries the work using the air stream alone.

For cleaning bearings in quantity, the depots use spray devices made from standard 55-gal drums, as shown in fig. 2. A welded wire screen grid holds 10 to 15 bearings and associated parts, such as retainers, spacers, dust shields, etc. Above the parts a rotary spray head is mounted on a spindle so that jet action from the solvent pumped through it will whirl it rapidly and permit it to spray the parts uniformly.

Approximate cleaning time for most work in this spray cleaner is 10 min, the time previously required for cleaning the individual parts by low-pressure hand spray methods.

Spray techniques are also being used for tiny instrument bearings. This method has been found to be faster and to involve less danger from corrosion than immersion techniques. The bearings are usually retained on a fixture in order to minimize handling and a special grade of naphtha is used as the cleaning agent. Heated air passed through a porous stone filter is used to dry the bearings and eliminate condensation and subsequent rusting.

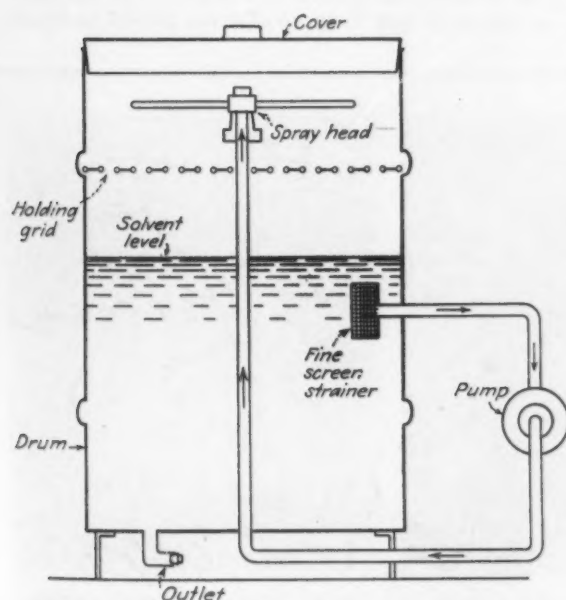


FIG. 2—Sketch of spray device developed for quantity cleaning of individual bearings and parts. Spray head rotates due to jet action from the pumped solvent to give an effective spray cleaning of parts loaded on the wire grid.

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A Metallographic Study Of

By L. J. BARKER

Metallographer,
Permanente Metals Corp.,
Trentwood, Wash.

PROBABLY the most common aluminum sheet material in use today is 3S alloy. This alloy is not heat-treatable and therefore belongs to a group called the common alloys. A range of strengths or tempers are made available in the sheet form by cold- or temper-rolling to impart yield strengths from 6000 psi for the fully-annealed material (3S-0) to 27,000 psi for full-hard (3S-H18). Intermediate tempers are: quarter-hard (3S-H12), half-hard (3S-H14), and three quarters-hard (3S-H16).

Though 3S is non-heat-treatable, its microstructure is fairly complex. It is the purpose of this article to describe etching methods for metallographic specimens so the metallurgical characteristics of 3S can be more completely studied. By analyzing the structure of properly prepared specimens, much information can be gained as to the temper of the sheet, history of fabrication and many of the properties to be expected. The method of polishing specimens is similar to that for other aluminum alloys and since numerous

articles* have been published describing the procedures, these will not be reviewed here.

The chemical composition of 3S consists of 1.0 to 1.5 pct Mn, 0.70 pct max Fe, 0.60 pct max Si, 0.20 pct max Cu and 0.10 pct max Zn; the only significant alloy additions being the manganese and, to a lesser degree, iron. The latter two elements form, with aluminum, the constituents

* Suggested references are: L. F. Mondolfo, "Metallography of Aluminum Alloys," John Wiley & Sons, Inc., New York (1943) F. Keller, "Metallography of Aluminum Alloys," Metals Handbook, Amer. Soc. for Metals (1948); and, F. Keller and G. W. Wilcox, "Identification of Constituents of Aluminum Alloys," Tech. Paper 7, Aluminum Co. of America, Pittsburgh (1942).

Al-Mn ($MnAl_6$) and Al-Fe-Mn ($MnFeAl_6$) which are responsible for increased hardness and, in some instances, better corrosion resistance than commercially pure aluminum sheet.

The beginning of an alloy, such as this, is in the molten condition as it is made up in the usual openhearth type furnace of from 20,000 to 30,000



FIG. 1—Structure of chill-cast 3S ingot showing network of Al-Mn (light) and Al-Fe-Mn (dark) constituents in the grain boundaries. Keller's etch. 500X.

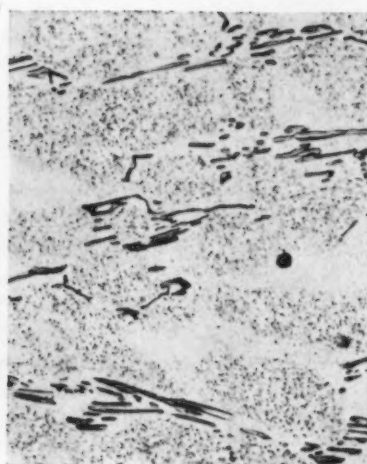


FIG. 2—Structure of 3S ingot after 15-hr preheat at 900° F. Note slight rounding of main constituents and small dispersed background constituents. Keller's etch. 500X.



FIG. 3—Structure after preheating for 15 hr at 1025° F. Note greater rounding of constituents and larger background precipitate than evidenced in fig. 2. Keller's etch. 500X.

Aluminum Alloy 3S

Many of the problems encountered by aluminum fabricators can be alleviated by a proper analysis of the microstructure of finished aluminum alloy 3S sheet, the most commonly-used sheet alloy, prior to drawing or forming. Etching methods for metallographic specimens which offer a means of checking structural properties are discussed by the author. The study reported on indicates that background or secondary constituent structures carry through rolling and annealing operations and serve as a reliable guide to temper of the sheet, history of fabrication and properties to be expected. Etchants for development of the various structures are recommended.

lb capacity. In making up a charge of 3S, manganese is added to high purity pig by means of aluminum-rich, 3 pct Mn ingots, and after proper stirring and fluxing, the metal is cast into forms dependent on its final use; flat ingots for rolling or cylindrical shapes for extrusion. The most widely employed means of casting these ingots is the direct chill method. This method consists of casting into a thin water-cooled form with a false bottom that moves downward as the ingot solidifies and contracts away from the walls.

At the pouring temperature of the metal, about 1350°F, the alloying elements are dissolved in the molten aluminum. As the metal solidifies in the mold, small nuclei of nearly pure aluminum freeze out and grow until contact is made with other growing crystals. The number of nuclei that form and the rate of solidification is largely determined by rate of cooling, and this in turn controls the ingot grain size. The alloying ele-

ments, manganese and iron, combined with aluminum, freeze out last and form a network of constituents around the grains. The microstructure of a section of ingot, which was cast by the direct chill method, is shown in fig. 1.

Preheated Ingot Structure

In the as-cast form, the alloy is quite brittle and resistant to working. To alleviate this condition, the ingot is given a high-temperature homogenizing anneal called a preheat. In this operation, the ingot is heated to a temperature below the melting temperature but high enough to dissolve a portion of the Al-Mn constituents. (By referring to an Al-Mn equilibrium diagram, it is seen that an increasing amount of manganese is dissolved as the temperature is raised.)

If the ingot is heated to 900°F and held at this temperature for several hours to insure equilibrium and then slowly cooled to room tem-

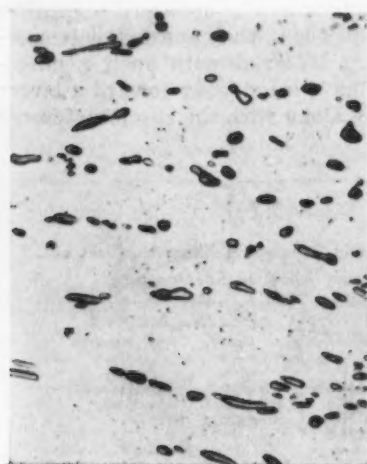


FIG. 4—Structure after preheating 15 hr at 1175° F. Extreme rounding of main constituents and large scattered background particles constitute optimum structure for rolling or working. Keller's etch. 500X.

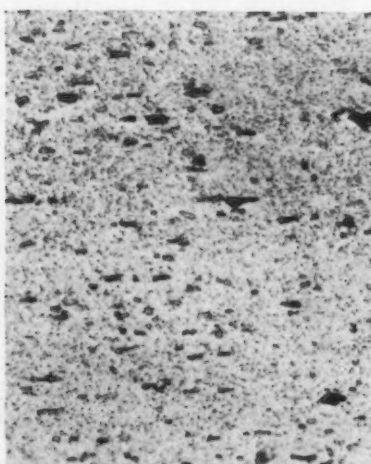


FIG. 5—Structure of 3S sheet rolled from ingot preheated at 900° F. Compare background with fig. 2. Keller's etch. 500X.

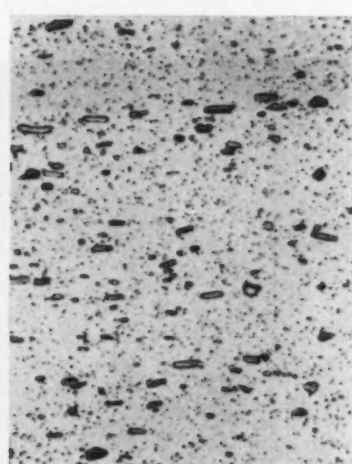
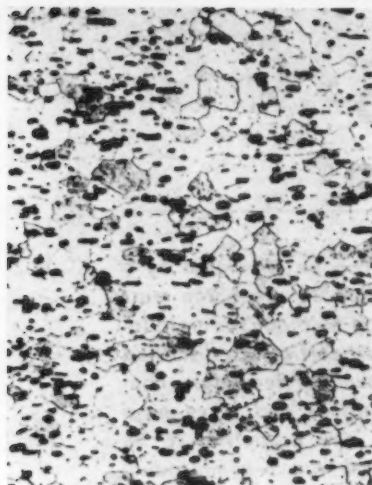


FIG. 6—Sheet rolled from ingot preheated at 1175° F. Compare with fig. 4. Note elongation of main Al-Mn constituents. Keller's etch. 500X.

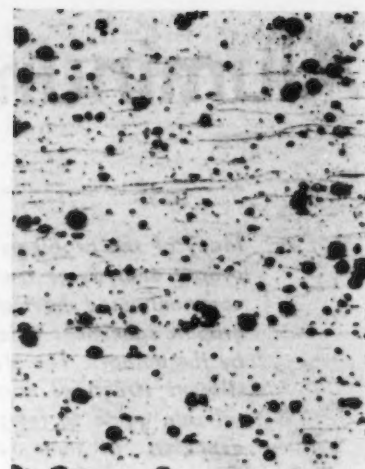


LEFT
FIG. 7—Structure of annealed 3S sheet revealing equiaxed grain pattern. Caustic etch. 200X.

o o o

RIGHT

FIG. 8—Structure of cold-rolled 3S sheet (3S-H18). Note extreme elongation of grains. Caustic etch. 200X.



perature, the microstructure will appear as in fig. 2. At this temperature, 0.4 pct Mn is in solution and, upon slow cooling, will reform as extremely small particles within the grains. The original constituents round off slightly as some of the Al-Mn dissolves.

At a temperature of 1025°F, approximately 0.7 pct Mn is in solution. The microstructure of a sample of ingot soaked 15 hr at this temperature and slowly cooled is shown in fig. 3. Note the agglomeration of the previously smaller particles, fig. 2, into larger, more easily discernible ones, and the greater rounding of the original constituents.

At 1175°F, nearly all the manganese will be in solution. A considerable amount of it reforms in the boundaries upon cooling, but some of it diffuses into the grains to form secondary constituents. At this temperature, there is sufficient atomic mobility for the dispersed Al-Mn particles to agglomerate into larger, more definable particles. This microstructure is shown in fig. 4.

This last structure is the optimum one as far as rolling or working are concerned, for in this form the constituents are of a size and distribution that interfere least with the movement of

the slip planes during working, and the brittle aspect of a constituent network along the grain boundaries has been broken up.

Final Structure

As the sheet is rolled down from ingot to the final gage, the network of primary constituents breaks up into smaller, isolated particles which elongate somewhat in the direction of rolling; however, the background or secondary constituents carry through the rolling process, and even intermediate and final anneals, to the finished sheet in the same form evidenced in the preheated ingot. Figs. 5 and 6 show backgrounds in medium gage sheet that are remarkably comparable, in regard to constituent size and dispersion, to the corresponding preheated ingot structures of the sheets, shown in figs. 2 and 4.

By studying the microstructure of a finished sheet or a fabricated product, it is therefore possible to determine to a great extent the adequacy or temperature of preheat treatment. Lack of preheat or a preheat of 900°F, which is the minimum hot-rolling temperature, will produce a microstructure in the sheet as seen in fig. 5. This background structure will be apparent regardless of whether the sheet is in the annealed or temper-rolled condition. Material with such a microstructure would have a tendency toward a larger grain size, which, along with the slip interference

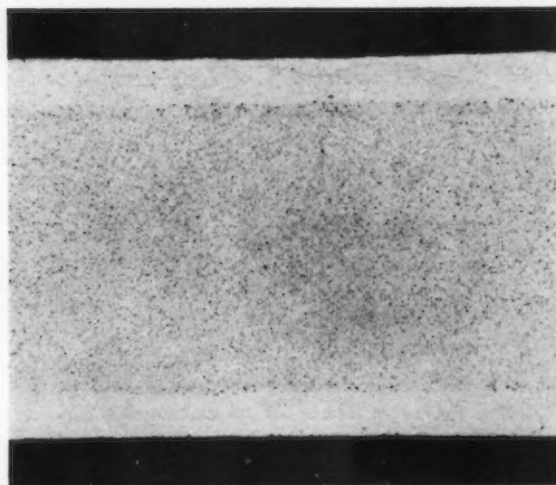
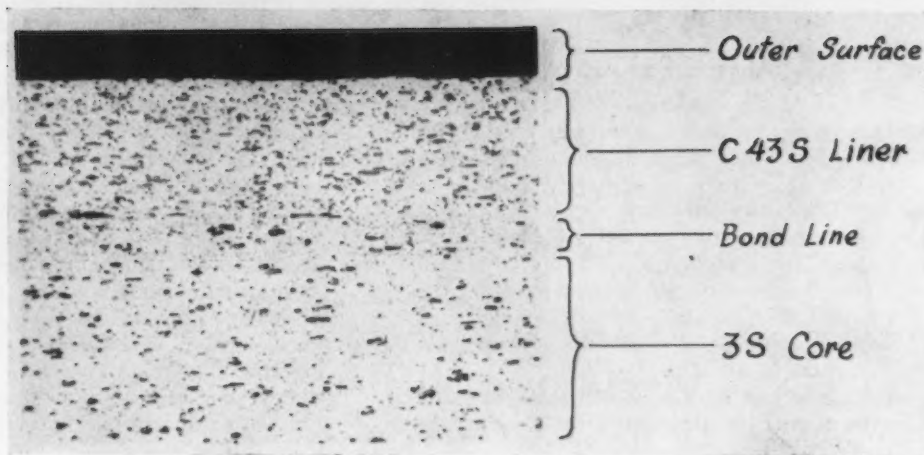


FIG. 9—Full cross-section of 3S alloy clad with a 1 pct. Zn liner. Note perfect bonds and faint grain outline in cladding. Keller's etch. 50X.

TABLE I
Etchants Used in Developing Microstructures of Aluminum Alloy 3S Specimens.

Etching Reagent	Formula	Use	Remarks
Keller's	2.5 ml HNO ₃ 1.5 ml HCl 1.0 ml HF 95.0 ml H ₂ O	To bring out background structure.	Immerse specimen for 40 sec.
HF	0.5 ml HF 99.5 ml H ₂ O	To darken constituents and reveal oxide.	Swab specimen for 15 sec.
Caustic	5 pellets NaOH 100 ml H ₂ O 1 ml ZnCl ₂	To reveal grain pattern.	Dip in boiling solution for 20 sec. Rinse, in succession, in boiling H ₂ O, HNO ₃ and H ₂ O.

FIG. 10—Photomicrograph showing liner of No. 11 brazing sheet. Silicon constituents in liner (7.5 pct Si) can be seen. Keller's etch. 250X.



offered by the small Al-Mn particles, would impart very inferior drawing and forming qualities.

By analyzing a metallographic specimen after etching in the proper solution, as listed in table I, it is possible to determine whether any 3S sheet material is in the annealed or temper-rolled state. Fig. 7, taken of a specimen etched in hot caustic solution, shows the equiaxed grain structure of fully-annealed 3S. Fig. 8 shows the elongated grain structure characteristic of 3S-H18, which also requires a hot caustic etch to reveal. By careful anodic procedures, these grain patterns can be more clearly revealed, but since the process requires special equipment, it will not be reviewed here.

Special Structures

For the ultimate in corrosion resistance, 3S alloy has been clad with a 1 pct Zn liner, fig. 9. The usual cladding thickness is 10 pct on each side. This gives a composite material with the formability and strength of 3S, but possessing a superior corrosion resistance. This added protection against corrosion is made possible

through electrolytic action in a manner similar to clad strong alloys where the cladding is anodic to the core; the difference in this case being that the core possesses good corrosion characteristics itself. Clad 3S sheet is used in the food, boiler and other industries where unusual corrosive conditions are encountered.

Another unusual composite is found in No. 11 brazing sheet, shown in fig. 10. In this case, 3S is clad with a material of excellent brazing qualities. The liner is composed of 7.5 pct Si with the balance Al, and the sheet is easily joined to other similar material by heating to approximately 1100°F and applying enough pressure to give a good bond.

Both of these composites are rolled in the same manner as clad strong alloys; that is, a liner previously rolled to 10 pct of the ingot thickness is placed on one or both sides of a 3S ingot and the whole composite bonded by giving it a severe pass or reduction through the rolls. In one pass, the liner or liners become perfectly bonded to the core material, and, after rolling to the finished

FIG. 11—Structure of 3S-H19, an extra-hard 3S. Structure is quite similar in background to that shown in fig. 5. Keller's etch. 500X.

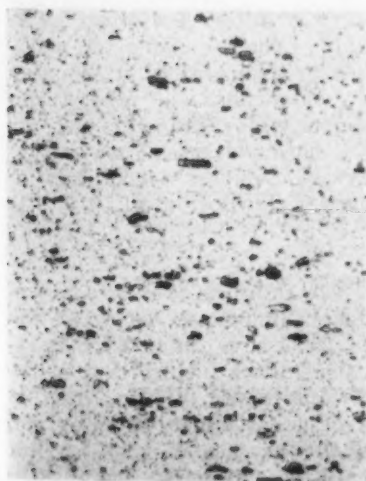


FIG. 12—Primary Al-Mn constituents in 3S sheet. Dark areas are due to particles pulled out in polishing. HF etch. 250X.

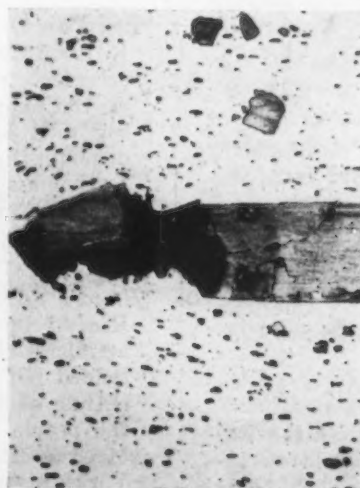
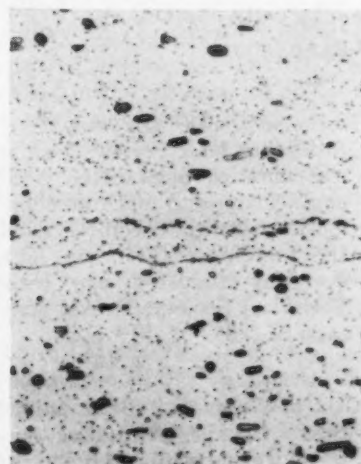


FIG. 13—Microstructure under a blister which was caused by inclusion of a thin film of aluminum oxide in the ingot. Oxide film layers are evident in the center of the material. HF etch. 250X.



gage, the final liner percentage will remain nearly identical to that of the original.

Abnormal Structures

The fine Al-Mn dispersoid background, carrying through to the finished sheet from a low temperature preheated ingot, is sometimes used to advantage when material stronger than the normal 3S-H18 is desired. Since these smaller particles help resist slip, an extrahard 3S can be obtained. This material has limited formability, but offers the other qualities of 3S material. Fig. 11 shows the structure of such sheet, denoted 3S-H19, which is quite similar in background to the structure in fig. 5.

Giant primary Al-Mn constituents are apt to form in aluminum pig with high concentrations

of manganese. These constituents remain undissolved in the remelt operation and are not broken up or dissolved in subsequent rolling or annealing in the making of even thin gage sheet. Such a constituent in medium gage sheet is shown in fig. 12. Since these constituents would seriously affect the formability of the sheet, the use of pig with high manganese content is avoided.

Blisters are sometimes found in 3S sheet as well as in other alloy sheet. These are usually caused by the inclusion of thin films of aluminum oxide in the ingot which will string out causing discontinuities in the sheet. The final result is an expansion of entrapped gases and consequent blisters. The microstructure of the sheet directly under such a blister is shown in fig. 13. The films of oxide are readily apparent.

... NEW BOOKS ...

"Strength of Materials," by C. O. Harris. Simplified discussion of the strength of materials, prepared both for engineering students and for industry personnel requiring a basic knowledge of the subject, is given in book. Stresses in beams, strengths of various types of joints, compression factors, fatigue in metals and other topics are dealt with. American Technical Society, Drexel Ave. at 58 St., Chicago 37. \$4.90. 212 p.

* * *

"The Basing Point System," by Fritz Machlup. Economic analysis of the basing point system reviews the history of the development of the system and the history of court examinations of it. Arguments as to the monopolistic or discriminatory features of the system are considered and a theoretical evaluation of the cost of abolishing the system is forwarded. Blakiston Co., Philadelphia 5. \$5.00. 275 p.

* * *

"Controllorship in Modern Management." Ten contributors, all industrial men, discuss the position of controllers in industry in this book. Organization of the controller's department, selection and training of controllership personnel and other subjects are covered. Richard D. Irwin, Inc., 332 S. Michigan Ave., Chicago. \$4.00. 300 p.

* * *

"Mathematics for Industry," by S. E. Rusinoff. Reference book reviews in simplified form the mathematics most often needed in practical engineering and machine shop practice. Arithmetic, algebra, geometry, trigonometry and the functions of each in jobs encountered in everyday industry are included. American Technical Society, Drexel Ave. at 58 St., Chicago 37. \$5.50. 519 p.

* * *

"Gift of Freedom." Book published by the Bureau of Labor Statistics is designed to inform workers in foreign countries how their

American counterparts live. Standards of working, buying power of wages in terms of an hour's work, the development and influence of the labor movement and other subjects pertinent to the worker's level of living are included. Supt. of Documents, U. S. Government Printing Office, Washington 25. 55¢. 150 p.

* * *

"Federal Employees in War and Peace," by F. T. Cahn. Personnel handling developments effected in the government over the past decade are described in book. Basic functions such as classification and salary standardization, recruitment, selection, promotion, transfer and removal are dealt with. Brookings Institution, Washington 6. \$3.50. 253 p.

* * *

"Proceedings of Fastener Manufacturers' Symposium." Book contains 13 papers regarding the American-British-Canadian unified screw threads. Historical background of the agreement, a description and analysis of the new standards and a discussion of the effect on fastener manufacture are included. American Institute of Bolt, Nut and Rivet Manufacturers, Hanna Bldg., Cleveland. \$1.50. 100 p.

* * *

"The Film in Industrial Safety Training," by P. R. Ignatius. Study of the use of films in worker safety training programs gives information on the extent to which films and other training aids are employed by industry and the opportunities for more widespread use and effectiveness. Harvard Business School, Div. of Research, Soldiers Field, Boston. \$1.50. 119 p.

* * *

"History of the Tools Division, War Production Board," by Bradley Stoughton. Record of the activities of the Tools Div. of the WPB is intended not as a definitive history, but as an outline of important events told in terms of the people and efforts shaping the program. McGraw-Hill Book Co., 330 W. 42 St., New York 18. \$4.00. 154 p.

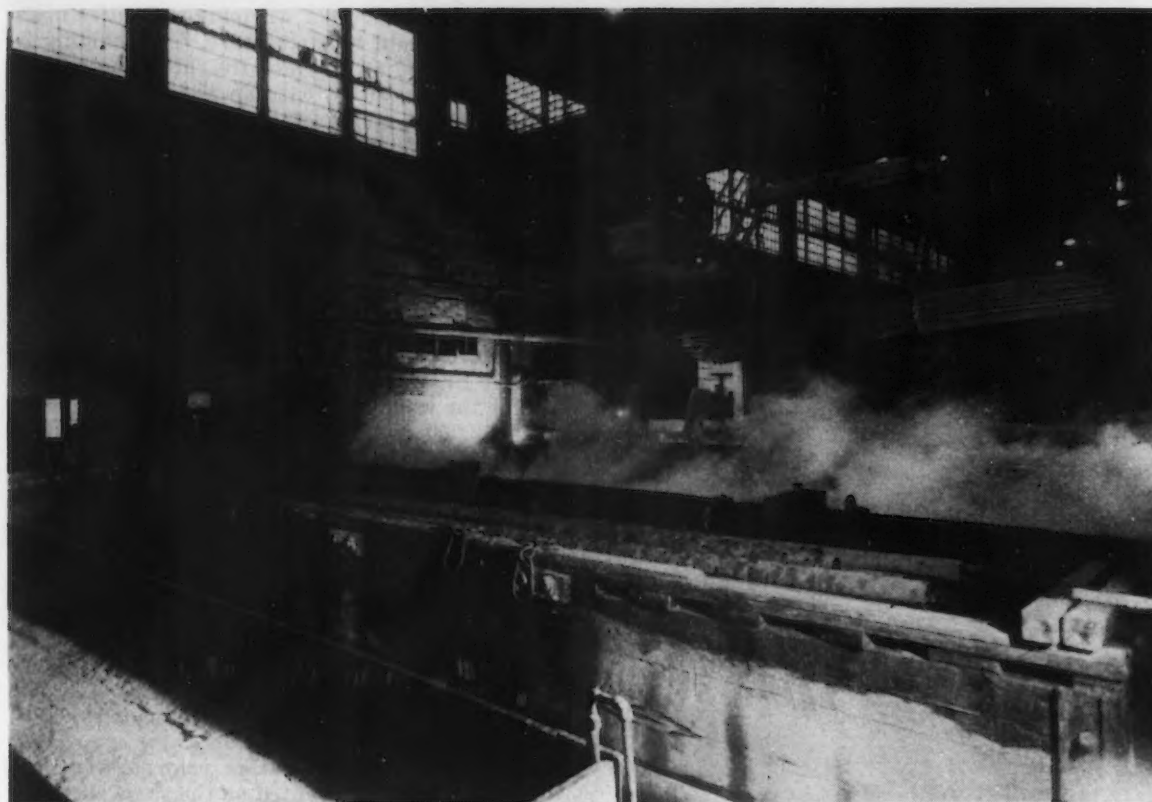


FIG. 1—Before the installation of special heating equipment, this pipe pickling shop was often fogbound to the extent that production was slowed. Now, warm air, discharged at high velocity through the openings seen on the rear wall, blanket the area over the tanks and reduce the fog.

Eliminating Pickling Room Fog

Fog created by condensation of vapor from pickling tanks often reduces visibility to the point where serious production slowups result. At the plant described in this article, the installation of heaters to provide a warm-air blanket over pickling tanks has effectively reduced fog formation. Details of the heater system are given.

BY J. T. BOLGER

*Assistant Superintendent, Welded Tube Dept.,
Jones & Laughlin Steel Corp.,
Aliquippa, Pa.*

REDUCED visibility due to vapor condensation above pickling tanks, particularly in cold weather, constitutes a serious production and safety problem. In the pickling and galvanizing shop at the Aliquippa Works of the Jones & Laughlin Steel Corp., the craneman in his cab 18 ft overhead often could not see the floor and tank operators as well as workmen at nearby galvanizing machines were unable to handle work efficiently because of the dense atmosphere. Occasionally it was necessary to stop production.

To ease the problem, combustion engineers installed four large air heaters which create a warm air blanket over the vats thereby reducing the condensation rate.

The shop has ten 3000-gal tanks, 25 ft long, in which pickling solution is steam-heated to about

180°F. When 5-ton bundles of hot pipe, as in fig. 1, are lowered by overhead crane into the vats for descaling, more vapor-generating heat is added. Prior to installation of the heaters, the rising vapors met the overlying layer of cold air, and condensation and a murky fog resulted. The shop was unheated except for a few small gas and coke-fired salamanders and cold air entered through a continuously-open truck door. The fumes themselves were nontoxic due to the use of an inhibitor in the pickling solution; nonetheless the fog handicapped operations and was detrimental from the standpoint of workman safety.

In studying the situation, J&L engineers decided the logical answer would be to increase the temperature of the air over the tanks so that condensation of the vapors would be reduced. Holding sufficient heat over the tanks, however,

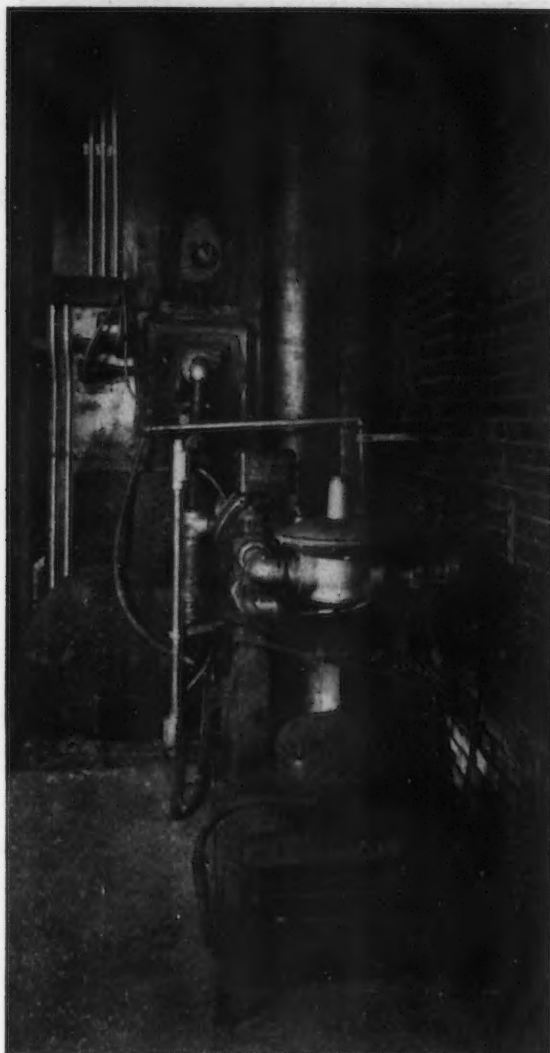


FIG. 2—Burner side of one of the heaters. A special blower is needed for combustion air because of fluctuating gas pressure.

seemed difficult without warming the entire mass of air in the mill type structure. The building is 325 ft long and 50 ft wide. Height to the bottom of the truss is 36 ft, with an additional 10½ ft to the bottom chord of the monitor roof. The monitor is 15 ft high with louvered openings forming its sidewalls. In such a building, warm air tends to rise rapidly and is lost through the roof. And it was not possible to install any heating equipment over the tanks without interfering with crane operations.

The equipment finally selected was a development of Dravo Corp., Pittsburgh. Four Counter-flo heaters, each having a capacity of 2 million Btu per hr, were installed in metal lean-to sheds outside the wall of the shop. Each heater handles about 22,000 cfm of fresh air supplied by a fan assembly in the base of and integral with the heater. Turning on a single shaft, the fans are powered by an electric motor mounted on a hinge arrangement to provide continuous adjustment of the V-belt drive. The motor is in the air stream and is kept cool. Fig. 2 shows the burner side of one of the heaters, while fig. 3 is a general view of the heater houses along the wall of the pickling and galvanizing shop.

Fresh air flows first over two staggered banks of economizer tubes with inside swirlers. In these tubes, the hot combustion gases are cooled for maximum heat utilization prior to venting. The exhaust fan is mounted on the same shaft as the intake fans and pulls gases through the tubes to cause negative pressure in the combustion chamber.

After the fresh air passes over the economizer tubes, it sweeps the heater's stainless steel combustion chamber and is discharged into the pickling shop at a velocity of approximately 2000 ft per min through wall openings 12 ft above the floor. Only 6 of the 13 bays in the building are covered by the fog-dispersing heat blanket, but these are the areas in which the acid tanks are situated.

The hot vapors rising from the tanks now meet



FIG. 3—General view of the heater houses along the wall of the pickling shop. Air intake grills can be seen near the ground level.

air of almost equal temperature and the amount of condensation and resulting fog has been reduced considerably. There is no fog problem with the four rinse and two cold dip tanks also located in the building.

In addition to ability to handle large volumes of air and discharge it at high velocity, the heaters have another advantage making the equipment suitable for this application. This is the ability to use coke oven gas for fuel without endangering heater service life. The stainless steel combustion chamber in each heater is re-

sistant to corrosive attacks of the sulfur-bearing gas and, in addition, enables continuous operation of the heaters because of the heat resisting qualities of the metal. Special corrosion-resistant gas valves are also used. Use of low pressure coke oven gas necessitated the installation on each heater of a burner embodying a separate combustion blower.

During summer months when vapor condensation is not a problem, the units are operated with the burners off to ventilate the shop.

Centrifugally Casting Hollow Steel Ingots

CENTRIFUGAL casting is held to be the most satisfactory method for producing hollow steel ingots, as described in the *Iron and Coal Trades Review*, Apr. 15, 1949. The article, which discusses a paper presented at the September, 1948, meeting of the German Iron and Steel Institute, also described other methods for producing hollow steel ingots, namely, ordinary casting and boring, casting around a core, slush casting, piercing a cast ingot with a solid mandrel, as well as horizontal and vertical centrifugal casting.

Hollow ingots are used in the manufacture of the largest size of hollow seamless vessels such as gun tubes and high-pressure boiler drums. Small tubes can be made from solid billets by "bursting" in the Mannesmann-type mill or by piercing, followed by drawing down in the Pilger mill or extrusion press. The Pilger mill is limited in tube size to 2 ft maximum external diameter and to a billet weight of about 5 tons.

Centrifugal casting is considerably more rapid than the other methods mentioned, and small ingots with a wall thickness of 2 to 3 in. can be cast, stripped and ready for drawing in about 20 to 25 min. Also, the method produces a less segregated ingot than other methods due to the rapid solidification of the metal. The nonmetallic inclusions are smaller and more uniformly distributed. This is an important consideration for high duty steel parts such as pressure vessels.

The molds are a critical item in centrifugal casting and good heat resistant properties are essential. Formation of cracks is the chief problem and it has been found that short, thick walled castings are prone to longitudinal cracks while long, narrow castings are subject mainly

to transverse cracking. Too high a mold speed accentuates the cracking tendency.

Sand is recommended as a mold dressing. In one plant a 0.197 in. layer of sand is used which adheres to the mold by centrifugal force only. The mold in this case is made from tempered chromium-molybdenum steel and is water-cooled during the casting process.

In a typical horizontal centrifugal plant, the circular ingot mold rests on a series of supporting rollers and is revolved by a drive which can be coupled on at either end. At the conclusion of casting, the driving mechanism is uncoupled from the mold which is then lifted out of the machine for stripping.

In horizontal centrifugal casting the mold should be revolved at the slowest possible speed. At too slow a speed, small droplets fall from the upper parts during turning. The speed of rotation is as a rule dependent on the diameter of the casting with length being immaterial.

Successful horizontal centrifugal casting depends upon the following factors: (1) suitable mold dressing, (2) suitable mold material, (3) use of as thin a mold wall as possible, (4) correct preheating of the mold, (5) correct cooling and stripping technique, and (6) use of slowest possible mold speed.

While the horizontal method is, in many ways, simpler than vertical centrifugal casting, it possesses one unfortunate drawback in that, when the ingot is cooling after solidification, it is subjected to asymmetric forces as it lies in the mold and it may thus become distorted. To overcome this, a device which exerts a longitudinal pressure on the ingot during cooling has been developed.

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EXTENSION of the 2-way communication system to lift trucks as well as to larger handling equipment has proved profitable.

Radio Communication System

Cuts Materials Handling

WHERE plant operations cover a considerable area and where diverse materials handling equipment is called for, efficient use of both materials handling and transportation equipment becomes a difficult problem.

One solution is the installation of 2-way FM radio communication in the various plant vehicles. Such a system has proved exceptionally worthwhile at Manitowoc Ship Building Co.

Transportation costs at the company run approximately \$250,000 a year. Figures for the first three months operation since inauguration of the radio system indicate a 15 pct saving in such costs. Direct labor costs for a month in one department were cut to \$3000 from \$5400, purely by reduction of idle time spent waiting for handling equipment to arrive. Idle time in the transportation department has been cut 70 pct and twice as much work is being done by each vehicle as a result of the improved job scheduling made possible by direct radio contact.

Diversification of the company's operations has actually necessitated such a system. In addition to ship building and repair, company operations include steel plate and shape fabrication; the building of crawler type speed cranes, shovels and draglines; refrigerating equipment manufacture; and general contract machine and assembly work.

Building and manufacturing the various items creates a serious materials handling problem. For instance, one ship may require several thousand tons of steel to be handled in 6 or 8 weeks. Unloading, storing, and handling before and after fabricating operations is required. Over 2 million lb of castings come in during a month to be unloaded, stored, machined and stored again.

To handle this amount of material without stagnation of flow requires a variety of equipment including trucks, fork trucks, small rubber-tire truck cranes, trailers, massive 60-ton crawler cranes, a 100-ton crawler carrier railroad locomotive.



CENTRAL control station logs the activities of all materials handling equipment and provides the coordination link needed in the system.

Costs 15 Pct

By E. L. HAASE
Industrial Engineer,
Manitowoc Ship Building Co.,
Manitowoc, Wis.

Efficiency in handling a variety of materials where plant operations are spread over a considerable area is made difficult by the problem of locating the proper handling equipment and getting it to the job site quickly. At one plant, alleviation of this difficulty through the installation of a 2-way radio communication system has, as described by the author, cut overall materials handling costs 15 pct; reduced idle time in the transportation department 70 pct; doubled the work done by each vehicle, and enabled analysis of the manner and efficiency with which equipment is being used.

tive crane and a tugboat. Radio communications systems, made by Motorola, Inc., Chicago, have been installed in all. A central station for contacting all vehicles has been set up, and the central operator logs and schedules the activities of all vehicles.

The results have been more than satisfactory. Four trucks rented at \$96 a day have been eliminated, as the company's own fleet of 5 trucks has been found able to handle the work. Three loco-

motive cranes were once used. Now, under radio control, one can do the entire job.

As fast as a railroad car is unloaded or a fabrication job is finished, a radio call brings materials handling equipment to move the car or the material. Downtime, while crews wait for delivery of material or are stalled until material is removed, has been minimized.

Where once it was necessary to have a man walk the 3 miles of railroad track on the company



INCREASED efficiency provided by the communications system has enabled five trucks to do the work of nine.

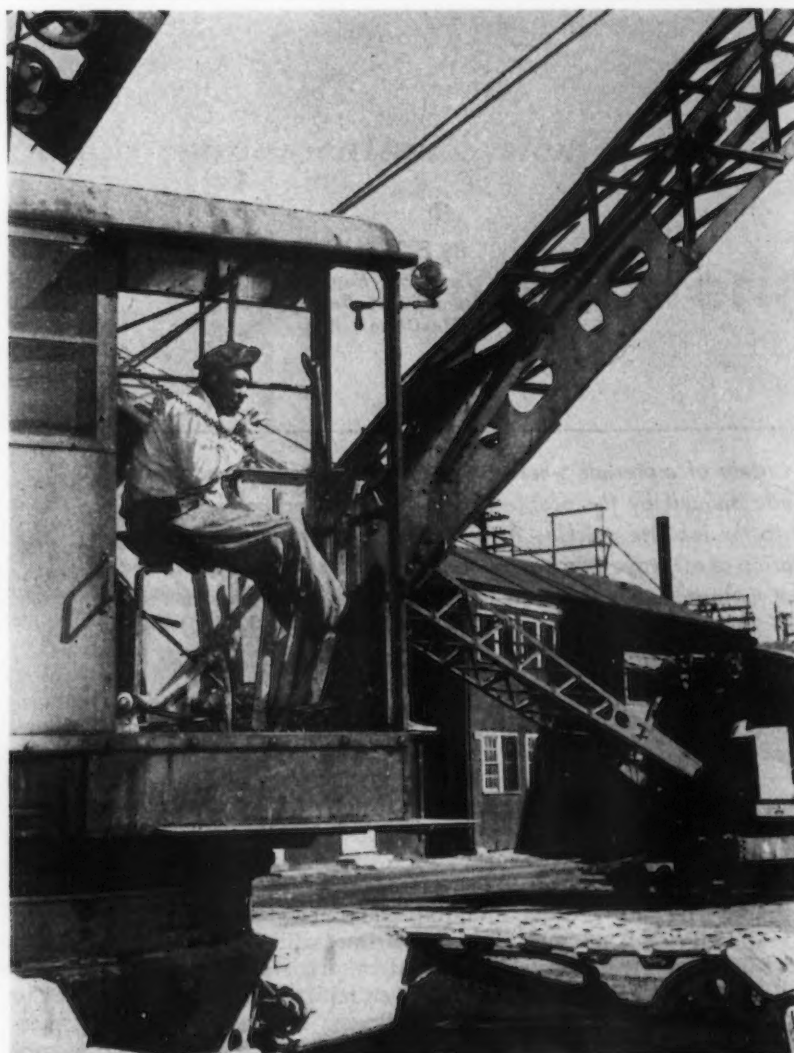
property to expedite equipment and materials handling work along the route, radio control now handles the problem much more efficiently. Locating the equipment for a particular job has been greatly simplified. As soon as the need for materials handling equipment is foreseen, a call to

the central station will bring the proper type equipment to the site at the proper time.

Maintenance of a log at the central station has the further advantage of providing a continuous analysis of the manner in which the equipment is being used and indicates quickly where and how improvements in effectiveness can be achieved.

The communications system has helped especially in maintaining contact with the tugboat. Formerly it was difficult to direct the movements of the tug once it had left the dock. Changes in plans often kept fitters and helpers waiting until the vessel could be contacted. With immediate contact now possible, much of this difficulty has been eliminated.

The system also contributes measurably to personnel safety. Emergency aid to personnel injured on the job can be speeded, and material and vehicles can be rapidly cleared in the event of emergency requirements.



CRANE operator maintains contact with central control station and can move along to the next job with minimum loss of time.

o o o

New Production Ideas . . .

Chromium plating and aluminum brazing machines, a scroll shear for cutting tinplate, single phase motors, a pneumatic temperature transmitter, a compressed air and gas conditioner, an industrial steam cleaner, side entering mixers, packaged laboratories, a tap chuck, live centers, carbide tipped tools, and machine-cast bar solders are discussed in this issue.



Chromium Plating Machine

FOR all types of chromium plating, a new machine, the Cro-Plater, is a complete plating unit, fully wired and ready for operation on delivery. It has a lead-lined Armeo tank and can deliver any required amperage up to 300 amp under precision control of current and temperature. The unit is equipped with a blower that exhausts the fumes from the tank and force-cools the copper oxide rectifiers. It is made in one standard size, with a 45-gal tank, 24x18x30 in. electrically heated by a thermostatically controlled unit located outside the tank. It requires a 220 v, 3 phase, 60 cycle, 50 amp. input. *W. S. Rockwell Co. For more information, check No. 1 on the attached postcard.*

Aluminum Brazing

THREE different gages of tubular aluminum are brazed with only a 50° temperature differential between the flow-point of the brazing alloy and the burning-point of the components, at the rate of 500 assemblies per hr on a special-purpose automatic gas-fired machine.

The two-stage machine has 16 soft-flame gas burners, each controlled for heat input and placed to give the required brazing-heat patterns. Operator-comfort is accommodated in the first stage by water cooling. A variable speed control is synchronized with the time-heat requirements at the operations. Correct combustion mixture of gas and air is supplied at constant pressure



to the brazing machine by a combustion controller. The installation is equipped with fire checks. *Selas Corp. of America. For more information, check No. 2 on the attached postcard.*

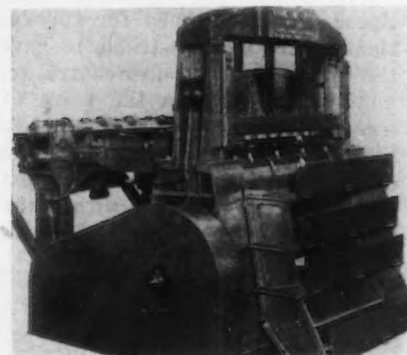
Single Phase Motors

A NEW line of integral horsepower, single phase motors feature a voltage relay replacing the centrifugal switch formerly used to disconnect the starting condensers from the line after the motor is up to speed. This relay is mounted in the control cabinet that also includes an across-the-line starter and the necessary capacitors, making possible the removal of the capacitor enclosure on the motor itself. These new motors are built in capacitor start-induction run types in ratings of 1 and 1.5 hp, and in capacitor start-ca-

pacitor run types in ratings of 2, 3, 5, 7.5 and 10 hp. The capacitor run types are supplied with oil type running capacitors that are also mounted in the control cabinet. Motors are available in open drip proof; splash proof; totally enclosed; fan cooled; and explosion proof construction. *Louis Allis Co. For more information, check No. 3 on the attached postcard.*

Scroll Shear

A SCROLL shear for cutting tinplate for subsequent production of can ends, or for blanking tongued bodies for rectangular, round, or tapered cans is said to save from 4 to 7 pct in the amount of tinplate required for can ends, because of accurate spacing when



cutting. Operating at high speed, the machine has a long die slide and rigid frame, giving true die alignment and resulting maximum die life. As the sheets are fed into the die, they are pushed back against positive stops at each stroke so that each cut is accurately spaced. Scrap metal goes into a discard bin, and front and back strips into their respective bins. Powered by a 3 hp brake motor for individual drive, the scroll shear can be equipped with hand-feeding or can operate with

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an automatic sheet feeder. Sheets handled on the shear range from 25 to 36 x 25 to 36 in. *Lima-Hamilton Corp.* For more information, check No. 4 on the attached postcard.

Tap Chuck

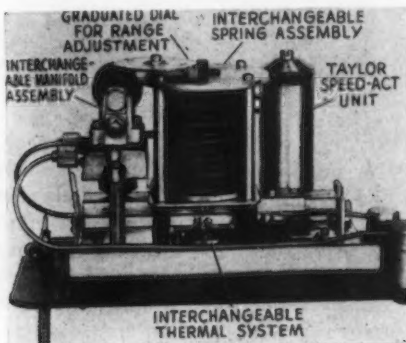
A NEW tap chuck eliminates the center-and-wrench method of tapping on a lathe or drill press.



Because the tap floats, threading accuracy is increased. Seven tap adaptors from 8-32 to 1/2 in. are interchangeable. The tap chuck is made in Nos. 2, 3 or 4 Morse taper. Overall length is 8 5/8 in. *Dahlstrom Mfg. Co.* For more information, check No. 5 on the attached postcard.

Temperature Transmitter

A NEW force-balance type pneumatic temperature transmitter called the Transaire with Speed-Act is designed for applications where it is desirable to have the indication, record or control remotely located from the point of measurement and where it is necessary to have accuracy, high speed of response, small thermal elements and short range spans within the limits of -375° and +1000°F.



Speed-Act overcomes the lag inherently present in the response of any form of thermal measuring element and makes possible quality of measurement. Transaire instruments detect process temperature

variations. Its output in psi is proportional to the temperature of its thermal element, and by means of 1/4 in. OD copper tubing, this pressure change can be transmitted to a recording or controlling receiver remotely located as far as 1000 ft away. *Taylor Instrument Cos.* For more information, check No. 6 on the attached postcard.

Aluminum Welding Alloy

FOR torch welding of aluminum at temperatures far below the melting point of aluminum, a handy Economizer kit contains 400 ft of 1/32-in. aluminum alloy and a jar of Eutector flux in the bottom section. Designed as a thin-flowing alloy for use with special flux, lap and slip type welds on aluminum become simple. Because of its fluid character, Eutec-Aluminum-Weld bonds readily to the surface, resulting in a clean, smooth weld. It is most suitable for joining thin parts. The finished weld is corrosion-resistant and has excellent color match. No after-machining is required. *Eutectic Welding Alloys Corp.* For more information, check No. 7 on the attached postcard.

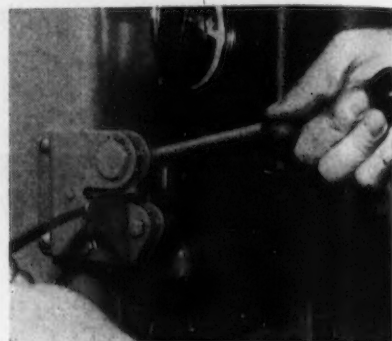
Electriweld Tubing

ELECTRIWELD tubing in square, rectangular, and oval shapes for streamlined modern design is being produced in the following range of sizes: Square tubing, min 3/8 in. and max 3 in., 14 to 20 gage wall; rectangular and oval tubing, 3/8 x 5/8 in. min, max any rectangular or oval shape that can be made from a max round size of 4-in. OD, the long size of the rectangular not to exceed 3 3/4 in., 14 to 20 gage wall. Other shapes can be produced to customer specifications within these size limits. *Jones & Laughlin Steel Corp.* For more information, check No. 8 on the attached postcard.

Blade Shear

CUTTING off bandsaw blades square and flat in preparation for welding into a band can be done with a cam and lever actuated shear that will take blades up to 0.045 in. thick and 1 1/4 in. wide. Clean quick cutting by the pivoted shear descending between two knife edge blades as the strip of material is positioned by a squaring plate

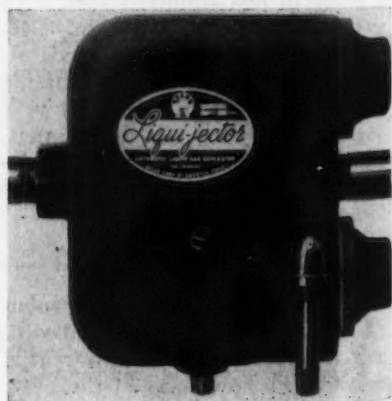
eliminates any deformity of material at the cut. A piece of blade 1/8 in. wide is removed so that an old weld can be cut out and at the same time the blade ends are squared in preparation for a new weld. No further grinding is required to square or flatten down ends for welding. The shear can



be mounted on the saw or permanently mounted on wall or bench. *DoAll Co.* For more information, check No. 9 on the attached postcard.

Air-Gas Conditioner

WATER and water-oil emulsions are removed automatically and continuously from compressed air or gas lines by the new Liquijector. The equipment is utilized in precision pneumatic operations that require positive conditioning of air or gas. Phase separation and liquid ejection are accomplished by two ceramic tubes; one water-repellent, and the other water-permeable but air-impervious. Compressed air or other gas passes through the first tube where it is stripped of its aqueous contamination and dirt. Moisture drops to the bottom and

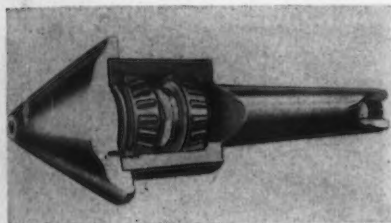


drains through the second tube without loss of air. The water ejection rates for the three sizes of the

equipment vary from 0.5 to 2.5 gal per 24 hr. *Selas Corp. of America.* For more information, check No. 10 on the attached postcard.

Live Centers

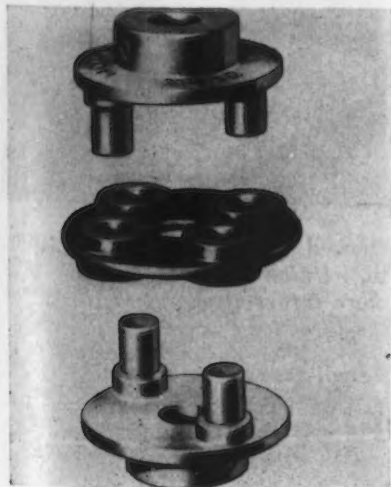
ENGINEERED with two sturdy, precision matched Timken bearings, Hi live centers are now available with interchangeable



male and female inserts. The dual roller bearing design permits the handling of heavier loads at higher speeds and greater precision, with a maximum runout of 0.0002 in. New pipe centers support pipe, tubing, hollow forgings and castings. The Nos. 2 and 3 Morse taper shank centers handle hollow work up to 2¼ in. ID; the Nos. 4 and 5 sizes hollow work up to 3½ in. ID. *Holub Industries, Inc.* For more information, check No. 11 on the attached postcard.

Rubber Center Coupling

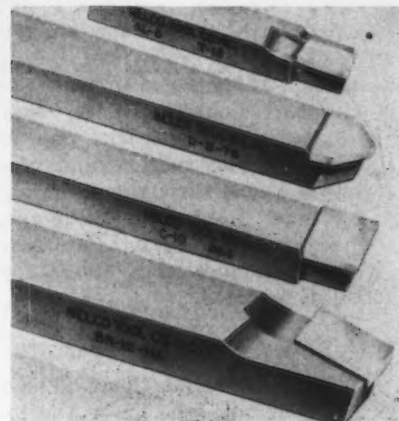
AN all rubber center of a coupling designed for improved power transmission in fractional horsepower motors absorbs flexing caused by misalignment. The tight fit of the coupling pins, when pressed into the rubber center member is said to eliminate noise and vibration, resulting in quieter, smoother operation. Shock loads are cushioned, resulting in longer



bearing life. *Morse Chain Co.* For more information, check No. 12 on the attached postcard.

Carbide Tipped Tools

STRESS relieved carbide tipped tools eliminate brazing strains through their slash milled design. Large sizes, also slash milled, are brazed with a nickel or constantan shim between brazed surfaces. Through these methods, the tip is brazed to one surface only. This minimizes brazing strains, thereby eliminating grinding cracks and tool breakage caused



from stresses in the tool. Carbide tips overhang the steel shank, allowing several regrinds before the steel must be ground. The overhang has no detrimental effect on the operation of the tools. *Nelco Tool Co., Inc.* For more information, check No. 13 on the attached postcard.

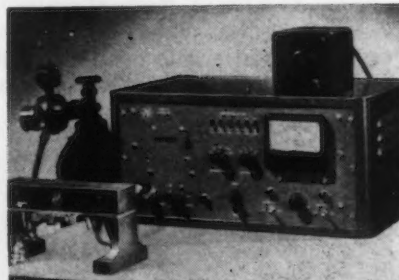
Precision Level

FOR leveling machine tools a new 12-in. precision level has a ground and graduated vial mounted in a 12-in. cast iron frame with the base precision ground on all useful surfaces including the V way for leveling shafts. The spirit vial has been selected to provide the correct sensitivity for quick, accurate leveling. It is substantially mounted in the frame and protected from breakage by an aluminum alloy cylinder that may be revolved to completely enclose the vial. *South Bend Lathe Works.* For more information, check No. 14 on the attached postcard.

Packaged Laboratories

TWO laboratory setups, either one providing complete facilities for routine counting or research work, consist of a basic group

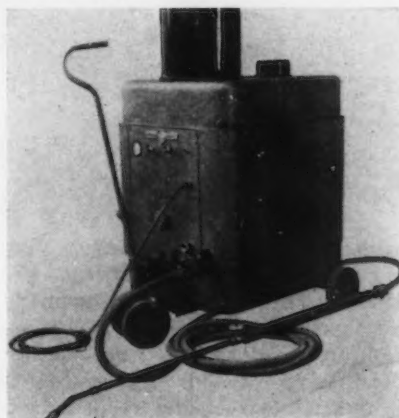
that includes a scaling unit, a thin mica end window Geiger tube, a convenient tube mount, and necessary connecting cables and sample dishes to permit radio-tracer research. This group, Model L-165, contains essential equipment for demonstration and for actual labo-



ratory work. The second, Model L-163 (illustrated), known as the Radioisotope Analyst group, is designed for the analysis of radioactivity. It includes an automatic scaler and the Q-Gas counter. With these instruments, precise work can be done with low activity, and low energy samples. When used with a timer, either predetermined time or count operations can be accomplished without attention from the technician. *Nuclear Instrument & Chemical Corp.* For more information, check No. 15 on the attached postcard.

Steam Cleaner

A HYPRESSURE Jenny steam cleaner develops 80 to 120 lb working pressure and its normal 45 gph capacity can be stepped up to 240 gph by means of an Adjusta-Blast gun that is optional equipment. Instant starting, instant steaming, automatic nozzle control mechanism that permits the operator to stop and start the machine at the cleaning job, and selective compound and fuel feed are other fea-

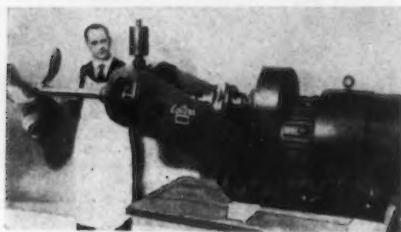


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tures. All units are oil fired and electric motor driven. The machine requires only 27x37 in. floor space. *Homestead Valve Mfg. Co. For more information, check No. 16 on the attached postcard.*

Side Entering Mixer

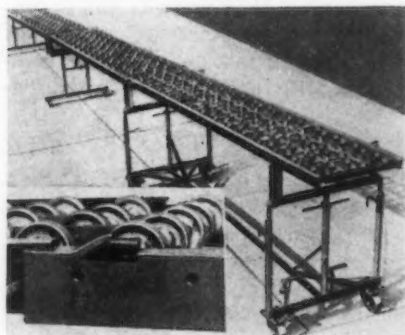
AGITATION of large quantities of liquids under severe operating conditions is possible with a new side entering mixer whose



stuffing box can be repacked without emptying the tank, by means of an outboard sealing ring that seals off the shaft while the packing is being replaced. The mixer is available in sizes from 10 to 30 hp. It consists of a heavy duty induction type motor, Moreflex coupling, special double packed type stuffing box, shaft and propeller. The shaft and propeller are available in several types of corrosion resistant alloys. Motors are available in all enclosures and for all voltages. *Eastern Industries, Inc. For more information, check No. 17 on the attached postcard.*

Telescopic Portable Conveyor

UNIFORM slope of a new portable telescopic conveyor assures an even ride for the load. The 5, 7½ or 10 ft sections lock to-



gether when fully extended so that there is no step-down between sections. The locking arrangement automatically assures correct positioning of the sections; no bolts or clamps are utilized. The conveyor is made in wheel and roller types.

Requiring no set-up time, the conveyor is instantly ready for action and can follow the load, thus eliminating any manual carrying when loading and unloading trucks, trailers, boxcars and storerooms. *Wilkie Co. For more information, check No. 18 on the attached postcard.*

Lightweight Propane Cylinders

NEW lightweight, high-strength Propane cylinders of 100 lb capacity and tare weight of 72 lb are made of special high tensile strength alloy steel to ICC specification 4BA-240. Cylinders are supplied with or without pressed steel caps, with valve inserted if desired. Advantages include superior corrosion resistance, easy sliding on and off trucks due to smooth-side construction, and uniform thickness throughout. They are trade named Lite-Weight. *Harrisburg Steel Corp. For more information, check No. 19 on the attached postcard.*

Materials Handling Loader

A NEW materials handling loader called the TL-W Tracto-Loader, has a ½ cu yd standard bucket. It is mounted on rubber

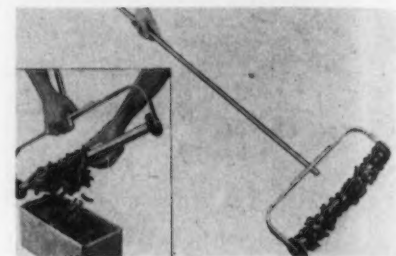


tires and has the bucket over the driving wheels and the steering wheels in the rear. Short overall length of 12 ft with bucket down and narrow width of 5 ft 9 in. permit working in limited areas. Close quarter operation is possible because the bucket is eased into the material and picks up a load through forward crowding action and an automatic tilt-back feature. The bucket is hydraulically-operated and positively controlled. It can be dumped in part or all at once. *Tractomotive Corp. For more information, check No. 20 on the attached postcard.*

Rotary Magnetic Tool

AN improved Multilift Rotary Tank Magnetool has 50 pct more magnetic power to pick up steel parts in tanks. The tool does

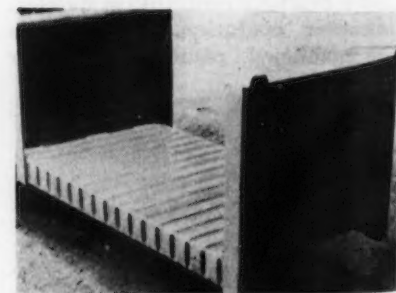
not attach to the tank and no contact with parts is necessary as they jump from 1 to 2 in. to the magnetic tube. Tank units resist ordinary acid and alkali solutions such as those used in plating, cleaning, etc., and are completely self-draining. The rotating magnetic tool is lowered into the tanks and propelled on its wheels or moved up and down. The tube loads on its



entire 360° of surface. Unloading is accomplished by pushing the wiper ring from one end of the tube to the opposite end where a non-magnetic area causes instant load release. Wheel and wiper are Neoprene. Standard models are 15 and 19 in. overall width. *Multi-finish Mfg. Co. For more information, check No. 21 on the attached postcard.*

Open-Side Pallet Rack

THE new open-side pallet rack combines the best features of both pallet and rack. It can be used to tier unit loads of odd shapes and sizes, and open sides make the materials easily accessible. It is available for both heavy and light loads. When tiered four high, the pallet-rack accommodates

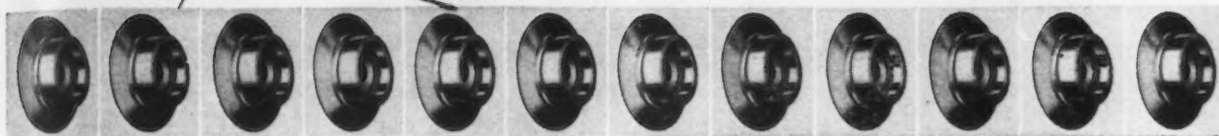


stacked loading exceeding 24,000 lb. *Union Metal Mfg. Co. For more information, check No. 22 on the attached postcard.*

Derail Guard

DESIGNED for use at points of most frequent derailment on interplant, mine and other rail lines the new Biggie derail guard

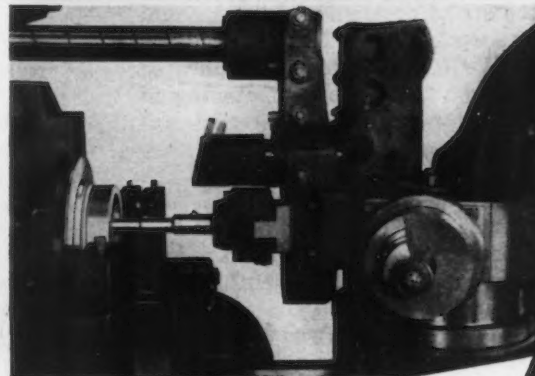
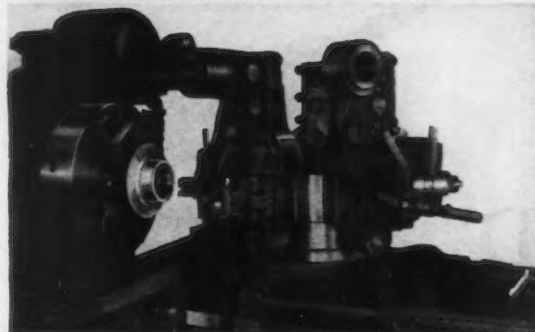
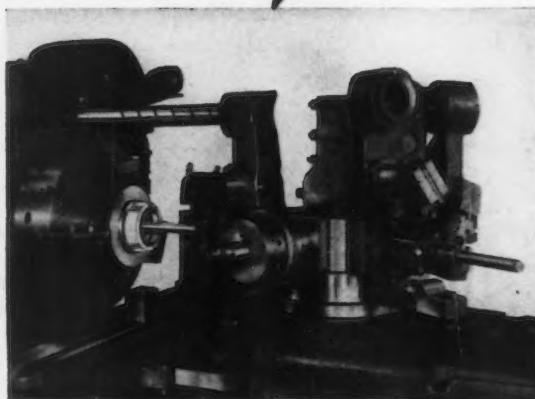
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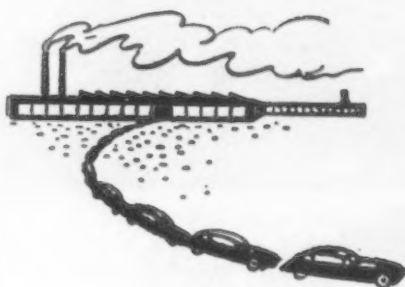
**AUTOMATIC
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UNIVERSITY OF MICHIGAN LIBRARIES

Assembly Line . . .

WALTER G. PATTON

• Ford strike is close to the explosive stage . . . Mr. Reuther addresses 8000 members at the Detroit Fair Grounds . . . GM crystallizes its plans for a Technical Research Center.



DETROIT—The Ford strike patient, already sick, became sicker this week. Admission on the part of both sides that no progress was being made in solving the strike problem was not enough. At week's end Walter Reuther, UAW-CIO president, complicated the case further by threatening to withdraw from the negotiations unless the company agreed to start bargaining on the contract. The strike negotiations and the new contract sessions would be held concurrently, using alternate sessions if necessary, Mr. Reuther explained.

The union move was entirely unexpected in labor circles here. Since Ford had already indicated it would not enter into contract sessions before June 1 or before the strike was settled—whichever was later—the union request for simultaneous bargaining sessions on the strike and the union's pension plans starting May 23 was more of an ultimatum than an invitation. Mr. Bugus accused the union of attempting to broaden the strike issue. Coming just a few hours before Federal conciliator Arthur C. Viat was scheduled to

enter the dispute, the union move undoubtedly increased the difficulty of an already tough and complex mediation job.

Various explanations have been offered to justify the latest union strategy. At the present time, the Ford strike is a minority affair. Less than 3950 workers in the Ford "B" building and Lincoln-Mercury plant are directly involved. However, 102,000 Ford workers have already been thrown out of work and the number is destined to grow as the strike spreads to Ford's 17 assembly plants and more than 6500 vendors.

Another interpretation of the move is that it gets Mr. Reuther "off the hook" by tying-in the Ford pension and insurance demand with the "speedup" strike. Hence, all Ford employees would have a stake in a speedup-contract strike instead of the present minority. The new union strategy also has the advantage of tying in the UAW-CIO with the steelworkers drive for pensions.

Last Thursday evening more than 8000 Ford workers drove in heavy rain to the Detroit Fair Grounds for the first rally staged by the UAW-CIO since the Ford strike began. It was a good show. Whether or not one agrees with Reuther, it must be recognized that he probably has no peer as a labor orator. The applause which interrupted the speaker on many occasions was generous—in strong contrast to the response to five other speakers on the program.

MR. Reuther worked his listeners to a high emotional pitch before he threw in his bombshell—the demand for simultaneous sessions on the speedup issue and the new contract. He got what he wanted—a practically unanimous vote to demand simultaneous bargaining on both the strike and the new contract. Mr. Reuther also got unanimous approval to reject Ford proposals to regulate the speed of the assembly line "without limitation" and to limit the strike to the Ford "B" building and the Lincoln-Mercury plant.

In his address, Mr. Reuther warned his listeners that "speedup" was really an industry-wide prob-

lem. All plants are attempting to cut production costs at the expense of the worker, he declared, and the union intends to resist such attempts to the limit.

Mr. Reuther insisted that the union had supported technical advances to increase production but held the union was completely justified in resisting efforts to work men even temporarily at a rate that is faster than the average rate. His declaration reemphasized the fact that, reduced to very simple terms, the Ford dispute revolves around one simple question: the company insists that the standard rate is an average rate; the union, on the other hand, is insisting that the standard or average rate is the maximum production rate.

Earlier in the week, Mr. Reuther had minced no words in condemning a Ford charge that the union is attempting to introduce "feather-bedding" into the auto plants.

While reasonably free from bitterness, the speech was punctuated with pointed references to the Ford wealth and the activities of the so-called Ford "propaganda mill." The union claimed the present Ford strike is as orderly and free from violence as any big strike ever called in this country. The claim appears to be justified. Thus far, there have been no skirmishes on the picket lines which are now about half as large as they were when the strike began.

AT the final session prior to calling in the conciliation service, Mr. Reuther introduced an 8 ft model of an assembly line built by the union's Engineering Dept. to demonstrate the auto workers' position. The model line was moved along by turning a crank. What the union insists on, Mr. Reuther explained to the press, is a steady line speed and equal spacing between cars. The company, he argued, wants to juggle the line speed or close the spacing between cars when an interruption occurs. Other car producers do not follow this practice, Reuther said, and some companies work their men overtime when production is cut because of interruptions caused by breakdown or delays in the flow of materials.

SINCE 1909

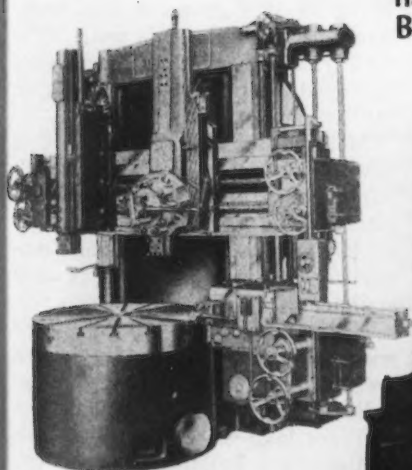
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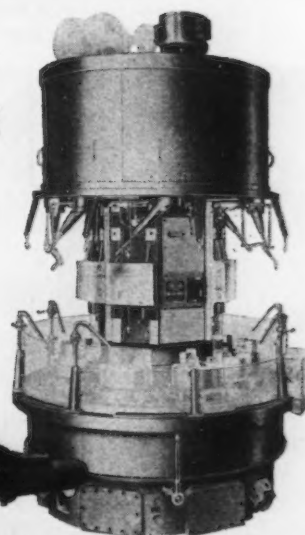
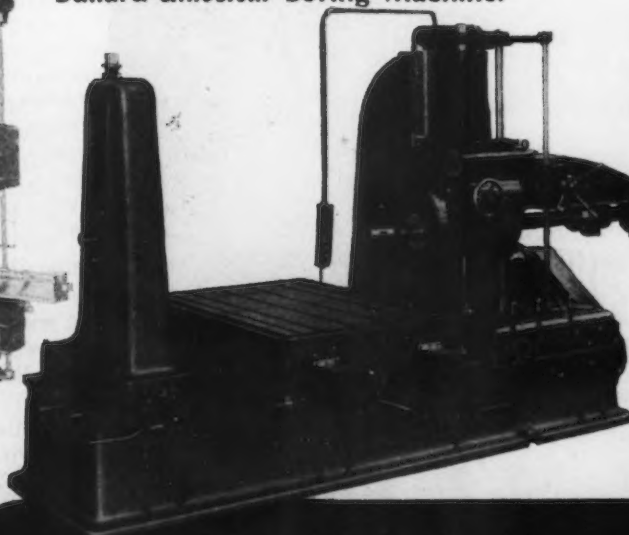
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He did not say whether Ford has ever resorted to overtime to catch up when operations were delayed.

Mr. Reuther contended that the company's insistence on "flexibility" in its production lines reflects lack of confidence by Ford management which, he insisted, is fearful of making decisions that may affect its speed of operations.

At his press conference Mr. Reuther denied that two cases of "speedup" in the Ford Motor Co. had been settled by arbitration. He asserted that the disputes in question involved work standards and not "speedup."

Company spokesmen have explained that the total production per worker per day has not exceeded the output scheduled for a particular work period. The company has advised its foremen that

changes in the daily output are permissible only when work methods are changed but has told its supervisors to insist on the company's rights to establish line speeds and job spacing within the established production schedule for a single day.

While isolated cases have been cited from time to time to show that the Ford assembly line practices have been changed to make up for lost production, no figures have been offered to the public to indicate the frequency of the interruptions or the number of cars allegedly "made up" by changing line speeds or job spacing. Neither has there been any indication that the situation is critical in Ford's 17 assembly plants or other assembly lines at the Rouge. Thus far, the dispute has centered around the

"B" building, and the Lincoln-Mercury plant. This prompted the company to suggest freezing of "B" building and Lincoln plants. The union rejected this offer as an ill-advised attempt to split the union.

GM Sets Construction Schedule for New Center

Detroit

• • • The General Motors Technical Center was reborn this week. Announced first on July 24, 1945, the original plan has been revised so extensively since that time that only the general outline remains. Even though the construction schedule is now established, many of the details of the new buildings are still undecided, according to sources close to the corporation.

The new research facilities will be located on a 350 acre sight at Mound and Twelve Mile Roads, northeast of Detroit. Construction will begin about June 15.

The Engineering Group, consisting of an administration and drafting, shop and dynamometer buildings, will occupy a total of 235,000 sq ft. This project will be started first.

The Research Group will consist of a metallurgical, laboratory, mechanical and processing buildings. Work on this group is also tentatively set to begin this year. It is understood that a completely equipped foundry is called for in the plan.

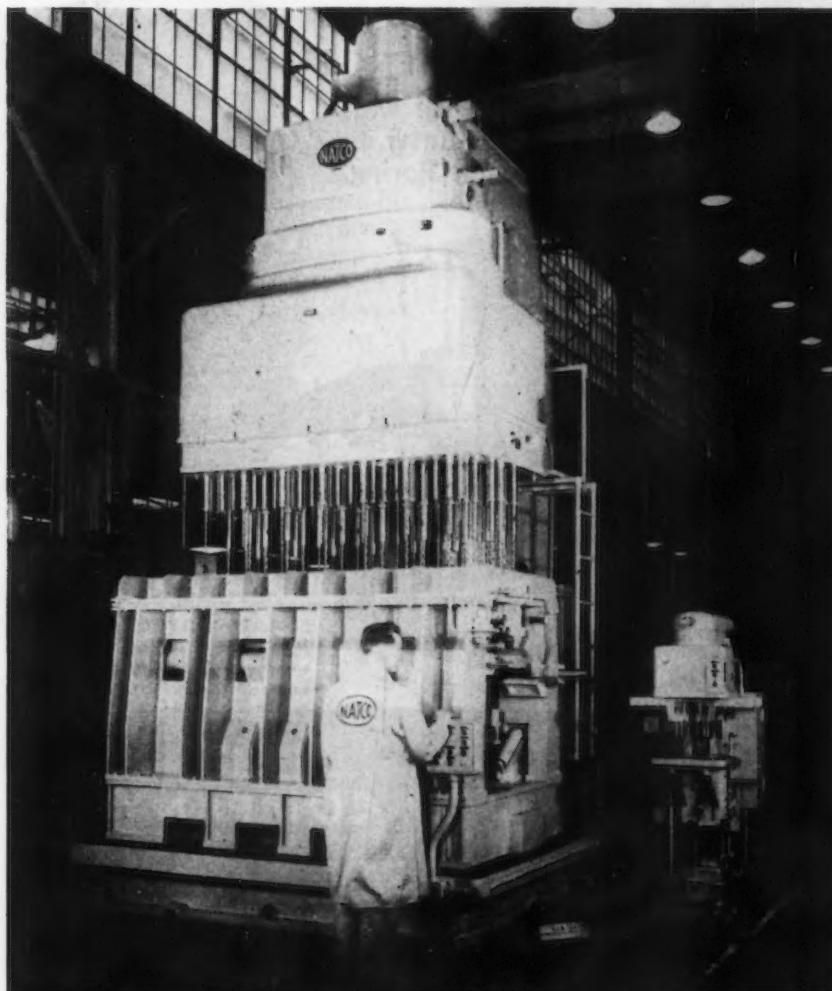
Meanwhile, construction of a power plant, sewage disposal plant, pump house and reservoir, central kitchen and service units will be timed for readiness when the Engineering Group is completed in early summer of 1950.

Ultimately, the Technical Center will also include the Styling Section and Process Development Groups.

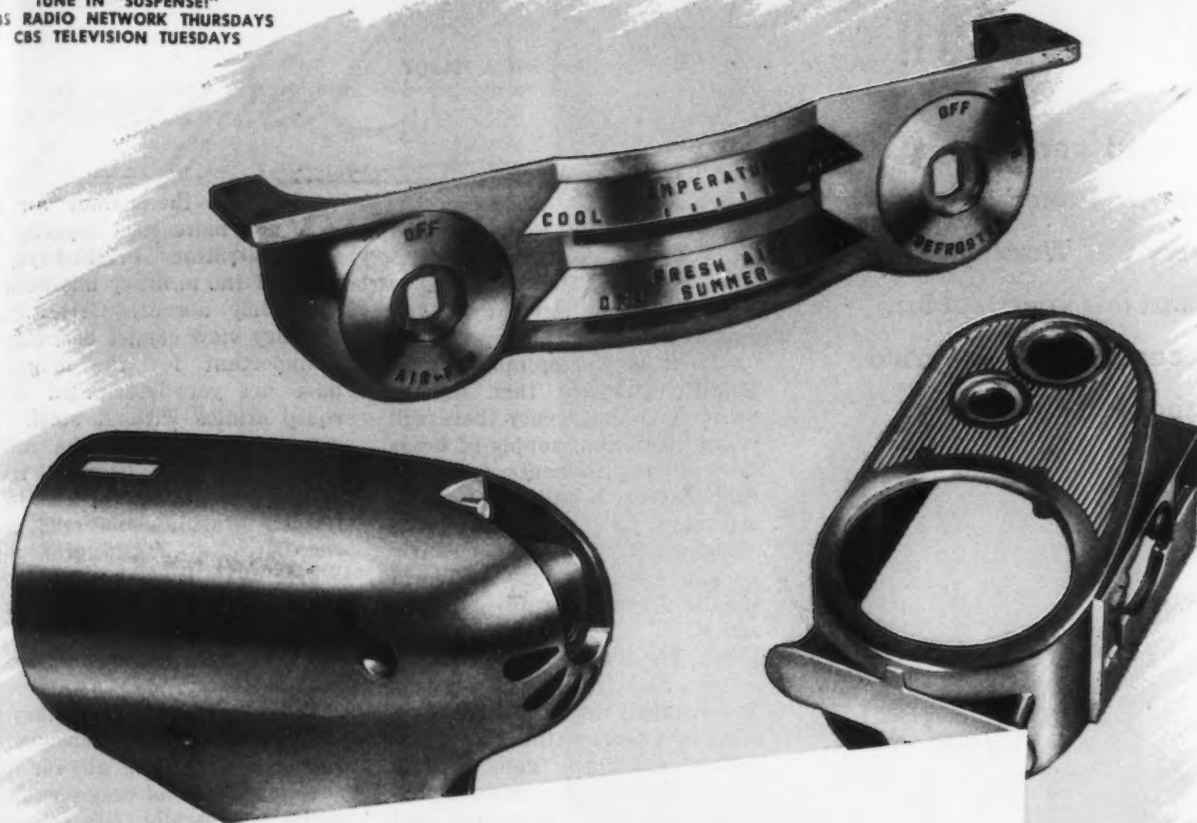
Buildings will be grouped around a 7-acre lake, with the central administration building on the west, engineering group on the north and the Styling Section on the south of the lake to take advantage of north lighting.

Much emphasis has been given to lighting in the new construction. Office buildings will be two or three stories plus a basement. Exterior walls will be largely made up of thermopane glass units. The glass panes are separated by dehydrated air and sealed at the edges by a glass-to-metal bond.

BIG RANGE: Shown in the photograph are the largest and the smallest machines built by National Automatic Tool Co., Richmond, Ind. The head drive motor for the small machine on the right is rated at 1 hp; more than 50 hp is required for the head drive of the large machine which has 105 spindles. Drills range from 0.3125 in. min to 1.0156 in. max. The large machine is used to drill diesel engine blocks.



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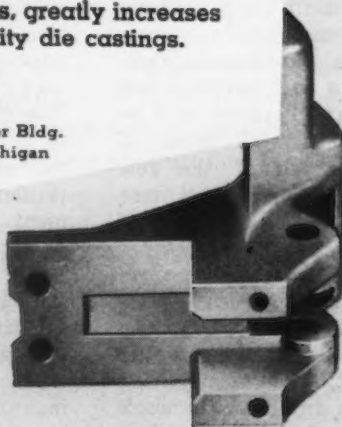
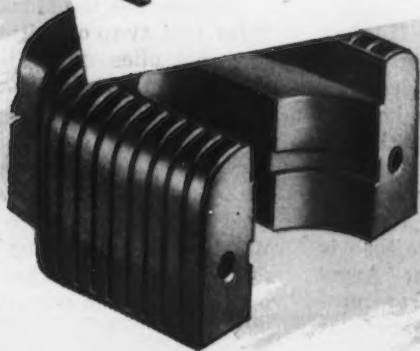
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• Steel cartridge case plant wanted by military . . . Work likely to start this year . . . Munitions Board not worried about steel capacity.



WASHINGTON—Determined not to be caught short by a shortage of brass in the event of another war emergency, the Army and Navy are hopeful that final action on military appropriations for the fiscal year 1950 will include funds for engineering studies and the first cost of machine tools and equipment for a standby steel cartridge case facility.

In any future mobilization, Ordnance officials in both services feel that steel cartridge cases will be used for practically all types of ammunition, instead of the few small sizes for which steel was used during the closing months of World War II.

While \$3.5 million has been requested for getting the work started, it is not likely that the final appropriation will permit this large an amount to be expended for this purpose. In any case, the work will not be stopped and the services will go ahead with whatever funds are available.

Basically, the Army and Navy want to set up this facility because of the lack of industrial capacity

for steel cases. More specifically, as pointed out by Rear Admiral A. G. Noble, Chief of the Navy Bureau of Ordnance, it was decided to undertake this project for the following reasons:

(1) It is the opinion of the Munitions Board that in the event of an emergency there will be an insufficient supply of brass to meet requirements for cartridge cases. It will therefore be necessary to manufacture cartridge cases from steel for nearly all guns, as was done in World War II for minor caliber ammunition.

(2) The requirement for higher velocities in modern weapons has resulted in increased pressures and temperatures in large-caliber rapid-fire guns. Steel cartridge cases are necessary to withstand these pressures and temperatures.

(3) There is only one existing source for large steel cartridge cases. It is highly desirable for both strategic and economic reasons to have a second source. Both Departments have obtained bids on steel cases from several manufacturers. In all cases the bids were much higher than those of the current supplier because of the great tooling costs involved.

Should the government augment the facilities of an additional private contractor to set up another source of supply, his entire production line would be in danger of disruption, at any time, due to economic pressure on the contractor. Therefore it is considered essential to set up the new facilities in a manner that will insure its continued availability to the government.

Major General E. S. Hughes, Army Chief of Ordnance also strongly supports the project, pointing out that at the end of the last war production contracts for steel cases were terminated and manufacturing processes were lost to the Ordnance Dept. He told Congress that "the project is strongly supported by the Army and Navy in order to reduce production requirements for brass in the event of a mobilization."

AMID all the clamor for more and more steel capacity from Administration bright-boys, the voice of the military has been conspicuously absent. Certainly, the military view cannot be considered unimportant for the bright-boys have not yet determined how to equip armies without steel. It is equally certain that the military will never underestimate its demands for steel and other raw materials. Businessmen who fought the battle of Washington during World War II are well aware of the fact that military supply officers could never be accused of being conservative in their statements of requirements.

What, then, is the military position regarding the adequacy of steel capacity? The answer to this question is not an easy one, for the military generally tries to stay out of such controversies during periods of peace. However, recent release of the military appropriations hearings before the House Committee clearly indicate that the military is not in agreement with the Louis Bean's, Leon Keyserling's and Crow Girard Davidson's.

During the course of these hearings, Donald Carpenter, Munitions Board Chairman, who is responsible for seeing that the military will have adequate supplies of materials in both peace and war, was put on the spot by a direct question from Representative Mahon, D., Texas. Mr. Mahon's \$64 question was as follows: "You then are not making any plans toward the enlargement of our steel capacity in the event of an emergency?" Mr. Carpenter's reply was equally to the point: "I do not know of anything we are doing on that."

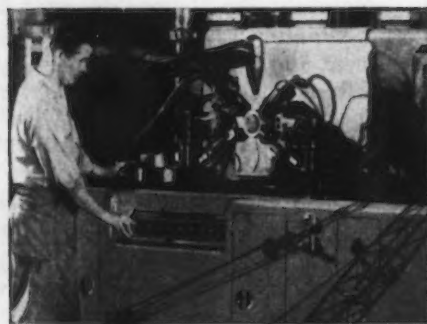
Elaborating, the Munitions Board chief told the committee that "we have not given a great deal of attention to steel, and have not had any difficulty to date in getting adequate supplies of steel. The voluntary allocation plan seems to work out successfully as far as the military requirements are concerned. We do not consider steel as serious as some of these other items. It is not an item on our critical stockpile list."

He later pointed out that the



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question of steel capacity "is a matter that should get further consideration in our preparedness planning for war, but it is not nearly as critical as many of the other items we have under more accurate study."

HERE in the Capital it was one of those days like Longfellow described—"No stir in the air, no stir on the sea." What I mean is that there was no news breaking, not even from the most reliable "official" sources.

I strolled into the Press Club, hoping to pick up a lead from the ticker. Again, no soap. But while I was pondering where to check next, my good pal from the State Dept., Joe Canasta, joined me. He mumbled a greeting and stood moodily before the ticker, hands shoved deep into his pockets.

"Why the long face, chum," I quipped. "You can see that all is sweetness and light. Ford and Reuther are negotiating, Lewis is dealing with the Southern coal operators, and even Vishinsky is talking to reporters. All's right with the world."

"You think so?" he said. I waited but after mumbling some-

thing that sounded like "blow-hards," Joe drew back into his shell. I let it pass, not being sure who he had in mind.

"Look," I said, "mebbe we both need a short beer. Let's repair to the taproom and talk it over."

Agreeably enough, he followed me to our destination and we settled down. After Louie brought our order, Joe took a sip, smacked his lips, and brightened a little.

"You're a steel expert—" he began. I tried to disclaim any special knowledge but he ignored my protests.

"Look," he said, "when and by whom was the rolling process for armor plate invented?"

"You've got me, chum," I said. "All I know is I seem to remember something about the Merrimac and the Monitor using armor plate about the time the Civil War began but I couldn't tell you if it was rolled or forged."

"It couldn't have been rolled plate," Joe said, "because the English didn't steal the process from the Russians until about the time the war started."

"What?" I yelled.

"That's right," Joe said, shoving

a clipping toward me. "It says so right there."

Having neglected my Russian in school, the text was all Greek to me—and I'd neglected to study Greek, too. I could tell that it was from something called "Literaturnaya Gazeta."

"You read it," I said, shoving it back across the table.

"More and more new documents are being discovered which corroborate Russian priority in discoveries in the fields of science and techniques," he began. "They also reveal the dirty machinations by foreign capitalists in appropriating Russian discoveries."

I hastily gulped the remainder of my draught. Joe continued with the translation.

"In the early '70's of the last century, the method of producing armor plate by rolling rather than by forging was applied for the first time.

"Until recently, metallurgists of all countries attributed this important technique to an Englishman. But in Soviet Navy archives, a document was found proving that the process was discovered by the Zlatoust master, V. S. Pyatov."

"But where do they claim the dirty work comes in?" I asked.

"It tells that, too," Joe explained. Again he mumbled something but this time it sounded suspiciously like "bums." He read on.

"Pyatov revealed his development and the Czarist Science Committee foolishly submitted it to the foreign 'beasts of prey' who said it was not only too difficult but dangerous.

"The committee received these references in February 1860. But a year later, in a British mill in Sheffield, a man named Brown not only applied Pyatov's roller system but was credited with the discovery. Thus a Russian discovery was stolen."

"Bushwah," I said. "Make it a long beer this time, Louie."

After a few moments of reflection over the second beer, I asked Joe if he thought Columbus might have been a Russian. My pal had now grown much more cheerful.

"I don't know," he said, "but I'm convinced that it must have been a Muscovite that developed the apple tree in Eden. That's about all that's left to be claimed."

THE BULL OF THE WOODS

BY J. R. WILLIAMS



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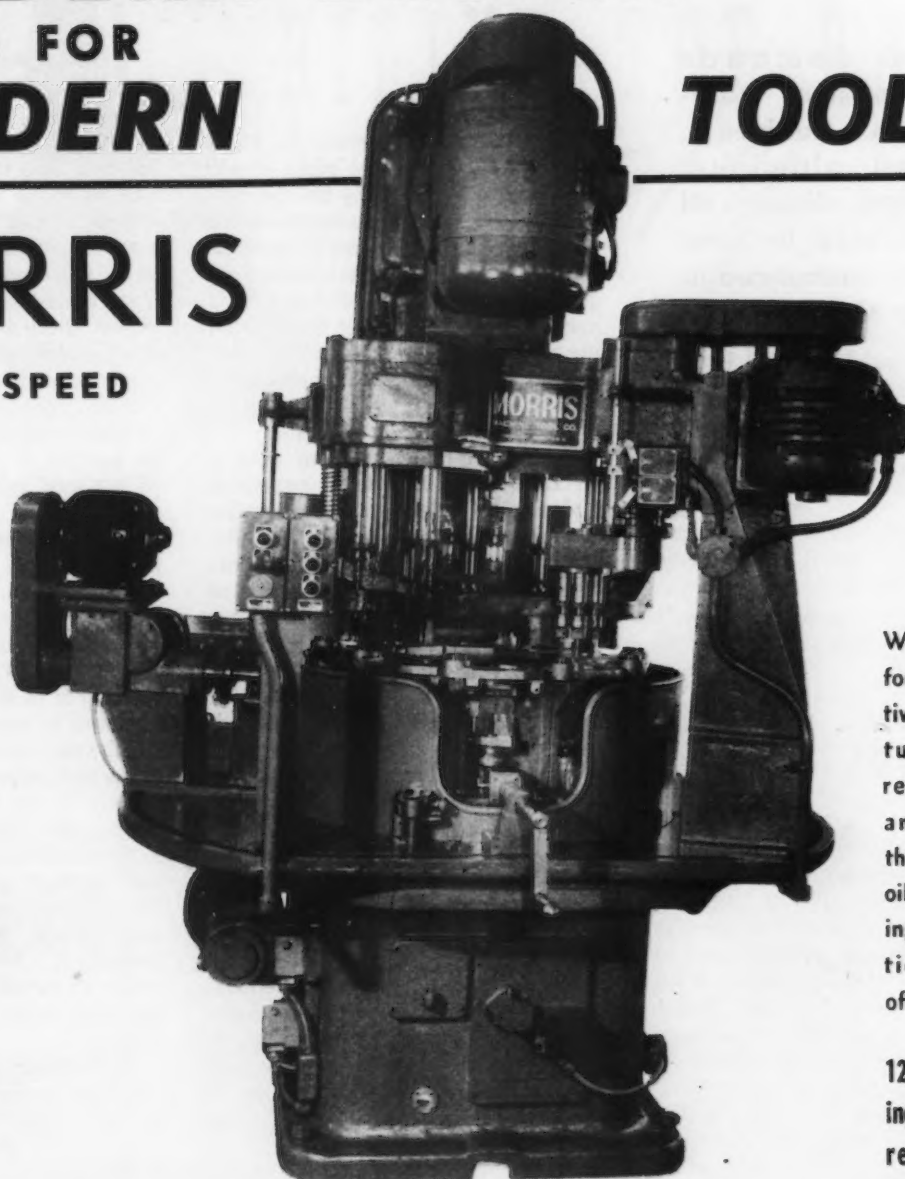
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CINCINNATI 3, OHIO

• Labor demands added to steel warehousemen's troubles... Northwest aluminum production sliding off . . . Little steel in latest small car announced in southern California.



SAN FRANCISCO — Operators of steel warehouses in the San Francisco Bay Area had considerably more to worry about last week than getting reservations to the National Convention. With business off between 25 and 50 pct during the first quarter of this year as compared to the same period in 1948, warehousemen are faced with demands by Local 6 of the CIO International Longshoremen's & Warehousemen's Union for wage increases and job realignment.

Most of the warehouses in this area are members of the Distributors Assn. of northern California which is carrying on negotiations with the union who number about 6000 workers in 375 Bay Area plants of various types.

The average increase demanded is approximately 15¢ per hr for men and 22½¢ an hr for women but apparently the steel warehouses were singled out for special attention.

General warehousemen now receive \$1.37½¢ per hr and an increase to \$1.62½ is being asked; order fillers now get \$1.45 per hr and the union is asking \$1.70 per hr. Other typical wage levels requested are: cage crane operators

\$1.77½ with an increase to \$1.82 after 1 year's service; plate shearers hope to get \$1.87½ on the new contract and this is to be increased to \$2.07 after 1 year's service. Other special considerations requested include the demand that hack saw operators get \$1.87½ on the new contract and \$2.07½ after 1 year's service when heretofore this type of cutting was handled by order fillers at the \$1.45 rate.

The union has voted to take a strike vote which would permit a strike to be called at the expiration of the present contract on May 31.

As is usual in such situations both sides give verbal evidence of their ability to maintain their respective positions. There is in this instance reason to believe that in the event an actual strike was called that it might well be prolonged with the odds in the favor of warehouse operators who maintain that the softening of the steel market and considerable tonnages on their floors purchased at high prices make it impossible to operate profitably at the proposed new rate. As one well informed warehouse official has expressed it, "business is just plain dead." Even the availability of a few carloads of cold-rolled or galvanized sheets fail to get the same men excited who only a few months ago were willing to pay premium prices for that commodity.

Aluminum Production Hit by Slackened Demand

Spokane

• • • Aluminum production is entering the same cycle as is steel if the situation of the Permanente Metals Corp.'s plants at Mead and Trentwood are indicative.

The Trentwood rolling mills laid off 400 men last week because of a slackening in demand for aluminum sheets but the Mead reduction plant is operating at capacity and has recently increased its payroll by approximately 100.

There is little indication that demand for aluminum sheets will pick up appreciably in the immediate future. One of the blows that hit

producers in the Northwest the hardest was the cancellation of 44 Boeing B-54 bombers by the Air Force. Then too, farmers are not starting construction projects as early this year as usual in spite of a warm and early spring. Salesmen report there is a tendency of farmers to restrict purchases to minimum necessities in the construction line and that there is some reason to believe that this reticence is due in part to a prevalent expectation of lowered prices.

The layoff at Permanente was not unexpected since the company announced in the middle of last month that a cutback of approximately 300 employees might be expected and termination notices were served. This curtailment of production is in marked contrast to the company's experience during the fiscal year which ends May 31 during which sales volume was approximately 20 pct higher than the previous year. An extra year-end 30¢ a share dividend on common stock and a final quarterly payment of 30¢ a share was announced earlier this month by Henry J. Kaiser, president. At that time net sales were reported as \$61,593,000 for the 1948 fiscal year ending May 31, 1948.

The Mead reduction plant not long ago poured its 500 millionth lb of metal since the Kaiser organization leased the plant in June of 1946.

Further expansion of the aluminum industry in the Northwest is in the offing as the Aluminum Co. of Canada is proceeding with its engineering surveys expected to cost close to \$1 million to determine the feasibility of construction of what is said would be the world's largest aluminum production plant in British Columbia. An initial study has been made of possible plant locations in that area but it is estimated that it would be at least 8 years before such a project could be completed.

A cut in production at Permanente's Mead reduction plant is threatened because of high flood waters in the Columbia River which is curtailing power production. Ironically enough, last winter power

RIDING THE RAILS

for 21 Years...

For more than 21 years Twin Disc has been "riding the rails" on track maintenance equipment built by the Nordberg Manufacturing Company, Milwaukee, Wisconsin.

In 1928, Nordberg first started using Twin Disc Clutches to transmit engine power on the Nordberg Track Shifter. Nordberg's most recent Twin Disc equipped machine is the Cribex used to excavate foul ballast from between track ties.

Like most leading manufacturers of heavy-duty equipment, the Nordberg Manufacturing Company has used Twin Disc Clutches and Hydraulic Drives for various types of track maintenance machines on the basis of many years of customer satisfaction.

TWIN DISC CLUTCH COMPANY, Racine, Wisconsin (Hydraulic Division, Rockford, Illinois).

1928

A Twin Disc Clutch was first used by Nordberg in 1928 on this Track Shifter, for which Twin Disc Clutches are still used.

The Nordberg Cribex on which Twin Disc Clutches and a Hydraulic Coupling are used, is shown as it excavates foul ballast from between track ties.

1949



Heavy Duty Clutch



Hydraulic Torque Converter



Hydraulic Coupling



Reduction Gear



Marine Gear



JUDGE TWIN DISC BY THE COMPANIES IT KEEPS

production was reduced because of restricted flows in that stream because of heavy freezes which restricted the amount of water available to operate the generators.

Prepares Production Of Small, Lightweight Car

Glendale, Calif.

• • • Departing from tradition, the Imp Motor Car Co. of this city is preparing to put into production a small, lightweight car built primarily of fabriglass and only 65 lb of steel.

If the Imp is placed in production as scheduled in 60 days, it will be the first of three small cars proposed to reach a rich southern California market to go beyond the display model stage.

First introduction into the mid-get car field was by the Bobbi-Car Co. of San Diego which took over a hanger used by Consolidated-Vultee during the war. When state officials refused the company permission to sell stock, Bobbi-Car moved to a southeastern state.

The Davis Car Co. occupied former aircraft buildings in Van Nuys and turned out several prototypes of a 3-wheel aluminum car. Deal-

ers were set up and distributor fees collected. The Davis never reached production and currently the company is being sued by dealers who claim to have put money up for their distributor rights.

Stanley Griffith, owner of the Imp Co., appears to have avoided the first two pitfalls as he has a prototype on display and has not sold stock or dealer rights. He plans to be his own distributor for the first few months because of a large volume of inquiries he has received.

The car designer found himself with a 9-hp gasoline engine perfected by Gladden Products for motor generator sets during the war. He proceeded to design the car to fit the small motor. During the war and at the present time, he also has manufactured Navy bomb sights and range finders. The Gladden Co. is an outgrowth of Kinner Aircraft, a wartime parts manufacturer.

Mr. Griffith took his idea for eliminating steel and using fabriglass from the Navy which has used this material in crash boats. Most of his 65 lb of steel is in the frame, steering wheels and tie rods. Each wheel is individually suspended.

The car definitely will be a "companion auto" if produced. It gets

65 miles per gal at a speed of 30 mph. It does not go much faster than this and comes only in a one-seater roadster. It is 120 in. long, weighs 480 lb and will sell for \$695, the inventor claims.

Industrial Activity Down

Salt Lake City

• • • The Ironton blast furnace of Kaiser-Frazer Parts Co. ceased operating May 20 and will be placed on a standby basis for an indefinite period. The working force had been reduced earlier so only about 200 jobs were eliminated by the shutdown.

Kennecott Copper Corp's Utah division will cut back to a 5-day 40-hr week at the end of May. The copper mining operation has been on a 48-hr week basis with the men receiving pay for 54 hr. The work time reduction will affect approximately 4200 men.

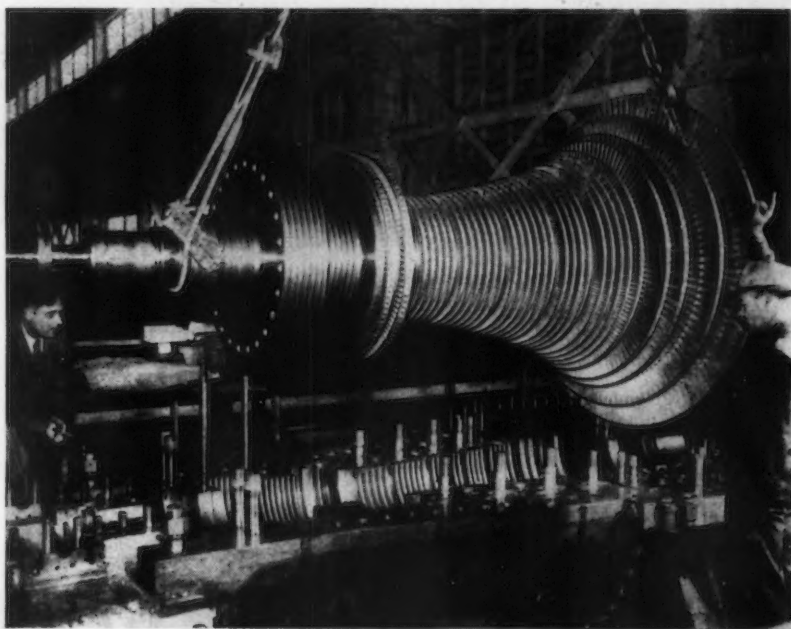
All other properties of the corporation are already on the 40-hr week basis, as are virtually all non-ferrous metal mining operation in the intermountain area.

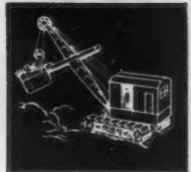
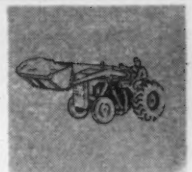
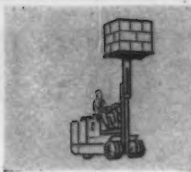
Nonferrous mine, mill and smelter workers who have seceded from the International Union of Mine Mill & Smelter Workers are putting pressure on the national CIO to do something about cleaning up Communist influences in that international union.

The annual convention of the Utah State CIO recently passed a resolution by unanimous vote calling upon Philip Murray and the national executive board to take such steps as are necessary to reinstate one clean union in the industry which is not Communist dominated. The seceded unions are now in the Progressive Miners committee and affiliated with CIO through the International Union of Marine & Shipbuilding Workers.

Simplot Fertilizer Co. produced its first sulfate of ammonia fertilizer at the war surplus Kalunite plant last week. Purchased several months ago by Simplot, the plant has remained idle because of inability to get anhydrous ammonia. A consignment of 8 carloads was received from the Texas Ordnance Works at Cactus, Tex., and shipments will continue at the rate of 15 cars per month. Simplot is seeking additional supplies of the ammonia.

WEST COAST POWER: A 12,500-kva steam turbine spindle is shown being eased into position in the lower half of its housing at the Sunnyville, Calif., plant of Westinghouse. For all its size, the turbine is built to tolerances as close as 1/10,000 in. This spindle with its more than 4000 blades will turn 3600 rpm. Each blade is made of stainless steel and machined to exact shapes to take maximum advantage of the steam pressure and flow inside the housing.



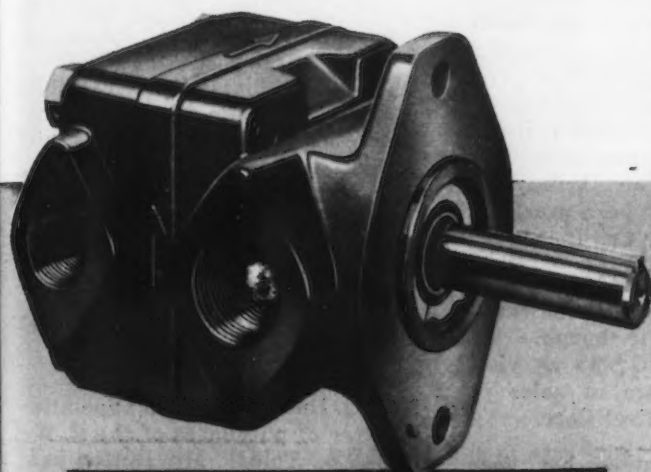


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mobile equipment service

the **NEW** series V-200

VICKERS

BALANCED VANE PUMP



THE ONLY PUMP THAT AUTOMATICALLY
MAINTAINS CORRECT RADIAL AND
LATERAL CLEARANCES AT ALL TIMES

The rigorous job requirements of construction, agricultural, automotive and materials handling machinery have long pointed out the need for a hydraulic pump expressly designed for this service. The new Vickers V-200 Balanced Vane Pump has been designed and developed to meet these requirements with the usual Vickers high quality workmanship . . . all adding up to the "Best Pump Value" for this industry.

Longer life at maximum efficiency, far in excess of fixed clearance pumps, is assured as the Vickers Pump is the only pump designed to maintain both radial and lateral running clearances at all times. Not only is normal wear perfectly compensated, the pump even automatically adjusts its clearances to oil viscosity variations resulting from temperature change. As a result, correct clearances are maintained and more oil is delivered for useful work.

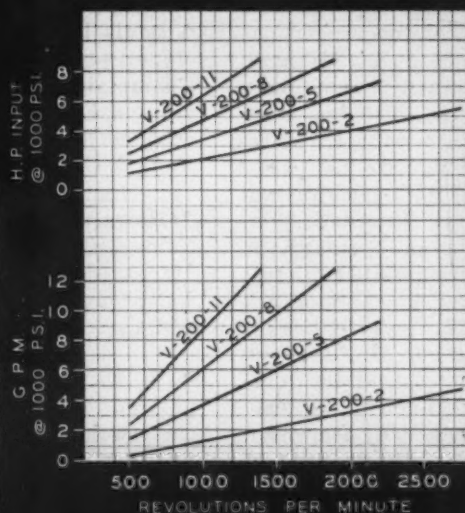
For many installations the nominal rated capacity of the pump is adequate, making it unnecessary to select the next larger size to provide additional capacity to compensate for loss due to high operating pressures, increased temperatures or normal wear. Thus, in many cases, a smaller pump can be used resulting in a more compact, efficient, and economical installation.

The tried and proven Vickers feature of "hydraulic balance" eliminates bearing loads resulting from pressure. The vane principle provides for no-load starting . . . important in cold weather cranking. Greater mounting adaptability is another advantage.

For better service, much longer life, with maximum efficiency all the way . . . you need Vickers V-200 Pump on your mobile equipment. Write for Bulletin 49-52.

AVAILABLE
IN FOUR
CAPACITIES
WITH THE SAME
EXTERIOR
DIMENSIONS

TYPICAL PERFORMANCE CURVES



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JOHN H. LESLIE, president, Signode Steel Strapping Co.

• **John H. Leslie**, formerly vice-president in charge of research and engineering, has been elected president of Signode Steel Strapping Co., Chicago, succeeding his father, **John W. Leslie**, who is now chairman of the board. **John S. Gorman**, formerly vice-president and director of sales, has been elected vice-chairman of the board. **J. M. Moon** has been promoted from sales manager to director of sales.

• **J. P. Williams, Jr.**, chairman of the board, Koppers Co., Inc., Pittsburgh, has retired from active management of the company.

• **Neil D. Cole** has been appointed contract supervisor of the Atomic Power Div., Westinghouse Electric Corp., Pittsburgh. Mr. Cole had formerly served in a similar capacity at the Westinghouse Research Laboratories in East Pittsburgh. **Charles J. Gerhart** has been named security officer of the Atomic Power Div. Mr. Gerhart had been with the headquarters police organization and had formerly been in the Westinghouse Naval Ordnance plant in Louisville. **Charles F. Stewart** has been named industrial relations supervisor for the division. Mr. Stewart had previously been a member of the employment department at the Trafford, Pa., plant. **C. H. Doran** has been appointed supervisor of receiving, store and shipping for the division. He comes to his post from the Lima, Ohio, plant of the company.

PERSONALS

• • •

• **Louis P. Monk** has been appointed member of the board of directors, Standard Steel Spring Co., Coraopolis, Pa. Mr. Monk also serves as vice-president of the company. **Edward L. Severing** has been named assistant to the president. Mr. Severing started as an office boy and rose through the accounting department to the posts of assistant secretary and assistant treasurer.

• **John F. Hackett** has retired as executive vice-president and director of the Riverside Metal Co., Riverside, N. J. **Lewis Van Dusen, Jr.** is leaving his post as president of the company but continues as a director and a member of the executive committee. **James T. Duffy, Jr.** has been appointed president, succeeding Mr. Van Dusen. Mr. Duffy had formerly been president of Read Machinery Co., Inc.

• **Thomas J. Hilliard** has been elected a director of McConway & Torley Corp., Pittsburgh. Mr. Hilliard retired in 1948 as vice-president in charge of sales of Carnegie-Illinois Steel Corp.

• **Raymond L. Larson** has been elected treasurer of the Oliver Mining Co., a U. S. Steel subsidiary. **Arthur L. Anderson** has been elected assistant treasurer of the company.

• **G. A. Lorz** has been named superintendent of operations at the Garrison plant of the Mackintosh-Hemphill Co. on Pittsburgh's south side. **C. R. Hodgson** is now superintendent of operations at the company's plant at Midland, Pa. Mr. Lorz joined the company in 1907 and since 1940 has been foundry superintendent in Pittsburgh. Mr. Hodgson has been Midland general foundry foreman since 1942. **O. B. Douthett**, who has been with the company 26 years, has been appointed general foundry foreman to succeed Mr. Lorz. **O. Feicht**, pattern maker since 1923, succeeds Mr. Hodgson as Midland general foundry foreman. **Walter J. Johnson**, formerly production manager at Garrison, is now assistant plant manager of the Garrison plant.



THOMAS S. BLAIR, president Blair Strip Steel Co.

• **Thomas S. Blair** has been elected president of Blair Strip Steel Co., New Castle, Pa., succeeding his father, **George D. Blair, Jr.**, who died. Prior to his new position, Mr. Blair served as associated editor of *THE IRON AGE* and had previously been engaged in research on the Manhattan Project at Columbia University in New York and at Oak Ridge, Tenn.

• **F. O. Dutton** has been appointed director of purchases of the E. W. Bliss Co., Toledo. Mr. Dutton had formerly been director of purchases for the Easy Washing Machine Co.

• **James E. Fuqua** has resigned as vice-president and general manager of Standard Castings of Cincinnati, Inc., after 15 years with the company. Mr. Fuqua retains financial interest in the company.

• **Louis T. Friedman**, formerly assistant professor of engineering at Champlain College, has been appointed head of the metallurgical engineering department of Sam Tour & Co., Inc., New York.

• **Howard Dahms**, formerly advertising manager for the O'Brien Machinery Co., Philadelphia, is no longer associated with that company.

• **V. E. Lawford** has been appointed sales representative in the northern California territory, Buckeye Tools Corp., Dayton, with headquarters in Oakland, Calif.

LOCALIZED HARDENING PROVIDES...

MINIMUM DISTORTION

MAXIMUM WEAR RESISTANCE

UNIFORM HARDNESS

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The highly perfected process of surface hardening gear teeth uses oxy-acetylene flame for heating only. This heating medium combined with the accurate mechanical features embodied in the Gleason surface hardeners make possible surface hardening of gear teeth with absolute uniformity, including a mechanical speed-up to avoid overheating the ends of the tooth and reversal of the burner slide to pre-heat the next tooth to be hardened. Each tooth of a gear is hardened for the same length of time, to the same depth, and each gear of a production run maintains the same uniformity for quiet, smooth, durable operation.

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NO. 2 SURFACE HARDENER



Builders of Bevel Gear Machinery for Over Eighty Years



FRANK V. CARROLL, consulting engineer, Inland Steel Co.

• **Frank V. Carroll** has been named consulting engineer of Inland Steel Co., Chicago. Mr. Carroll, who joined Inland in 1921 as assistant chief engineer, had formerly been chief engineer of the firm's Indiana Harbor works, in which position he had served since 1927. **Fred H. Johnson**, formerly assistant chief engineer of Carnegie-Illinois in Pittsburgh, has been named chief engineer of the Indiana Harbor works.

• **J. A. Voss** has been appointed to the national refractories sales force as representative in the Ohio-Pennsylvania area, Chemicals division, Permanente Products Co., Oakland, Calif. Mr. Voss has his headquarters at Akron. He had formerly been associated with Republic Steel Co. and Wisconsin Steel Works.

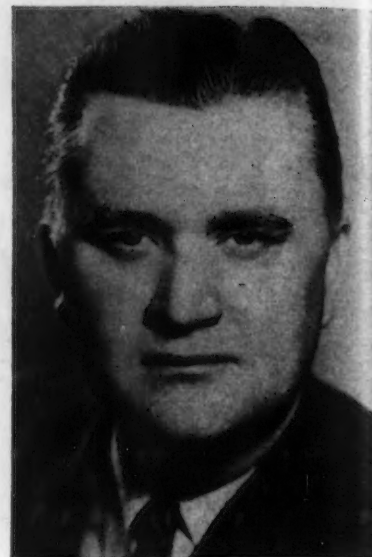
• **Wilbur D. Hockensmith** has retired as president of the Hockensmith Corp., Penn. Pa., and has been elected to the newly-created position of chairman of the board. **Wilbur D. Hockensmith, Jr.** succeeds his father as president and general manager of the corporation. **David M. Wagoner** has also resigned as treasurer, but continues as a member of the board. **John A. Johnson** has been named treasurer, succeeding Mr. Wagoner. **Franklin C. Hockensmith II**, executive vice-president and works manager, has been elected to the board of directors.

• **Albert H. Clem** has been appointed assistant manager of sales of the special chemicals division of Pennsylvania Salt Mfg. Co., Philadelphia. Mr. Clem, who has been field sales supervisor of the division, assumes the duties formerly performed by **Philip C. Staples, Jr.**, as product supervisor on cleaners. Mr. Staples has been transferred to the company's heavy chemicals division as a product supervisor. **George D. Grogan** has been appointed product supervisor in the division. Mr. Grogan had been serving as assistant to the field sales manager of that division. **R. S. Roeller**, formerly field sales manager of the heavy chemicals division, has been appointed manager of sales of that division. **Richard A. Weppner** has been appointed to the sales staff of the company's special chemicals division.

• **John W. Rogers** has been appointed sales manager, Wean Equipment Corp., Cleveland. Mr. Rogers joined Wean in 1934 and had formerly served as a sales engineer.

• **R. P. Connette** has been appointed assistant to the president of American Car & Foundry Co., New York. Mr. Connette joined the public relations staff of ACF in 1945 and in 1947 was transferred to the executive department in charge of the suggestion system and training program.

R. P. CONNETTE, assistant to the president, American Car & Foundry Co.



BURKE B. ROCHE, president, Binks Mfg. Co.

• **Burke B. Roche**, who has served as vice-president since 1948, has been elected president of Binks Mfg. Co., Chicago, succeeding his father, **J. F. Roche**, who has been named chairman of the board.

• **W. P. Newport** has retired as salesman at the Detroit office of Bethlehem Steel Co., Inc., Bethlehem, Pa.

• **Louis C. Upton** has been advanced from president to chairman of the board of Nineteen Hundred Corp., St. Joseph, Mich. **Elisha Gray** has been named to succeed Mr. Upton as president. Before becoming president, Mr. Gray had served as assistant to the president and later as executive vice-president. He is also a director of the company.

• **J. G. Wiegand** and **R. R. McKiel** have been named sales engineers for the industrial power division of International Harvester Co., Chicago.

• **Charles N. Hollingsworth, Jr.**, has been named sales manager and **John H. Noble**, assistant sales manager, Dravo-Doyle Co., Pittsburgh. Mr. Hollingsworth has been with the company for 25 years in the sale of road building and construction equipment. Mr. Noble has been connected with Dravo-Doyle for the past 20 years and was formerly a sales representative handling industrial and quarry sales.



GILFRY WARD, vice-president in charge of sales, American Manganese Steel Div., American Brake Shoe Co.

• **Gilfry Ward** has been named vice-president in charge of sales of the American Manganese Steel division of American Brake Shoe Co., New York, with headquarters in Chicago Heights, Ill. Mr. Ward has been with Brake Shoe since 1928.

• **J. H. Ferguson** has been named district manager of the Akron, Ohio, branch office of the Bristol Co., Waterbury, Conn. Mr. Ferguson has been with Bristol since 1923 and since 1940 has been connected with their Washington office.

• **C. F. Bonnet** has been appointed production manager of the industrial chemical division of American Cyanamid Co., New York, having been succeeded by **G. W. Russell** as assistant sales manager of the division. Mr. Bonnet has been with the company more than 15 years. Mr. Russell had formerly been manager of the new products development department. **James R. Dudley** has been appointed supervisor of new product development and **John D. McPherson**, supervisor of market research activities of the company. Dr. Dudley has been with the company since 1940 and prior to his new assignment had been assistant in charge of research on polymers and resins. Mr. McPherson joined the company in 1945 and had previously served in the technical division on engineering development of new plants.

• **Allan Craig** has been appointed general manager of the southwestern division of the Link-Belt Co. at Houston. Mr. Craig had formerly been sales manager of the company's southeastern division in Atlanta, since 1945. **Michael J. Perry** has been appointed to succeed Mr. Craig in Atlanta. Mr. Perry had been district manager at Moline, Ill., since 1946. **Andrew J. Kolar**, district sales engineer at Moline since 1947, has been named district manager in full charge of this office. **John D. Reilly** has been appointed district manager for the company in Newark, N. J. Mr. Reilly started in the Philadelphia plant in 1934 and since 1939 has been district sales manager in the Boston office.

• **Howard B. Haskins**, formerly with General Motors Corp., has joined Hudson Motor Car Co., Detroit, as executive engineer.

• **J. G. Schaefer** has been appointed manager of Allis-Chalmers newly-converted Youngstown district office. Mr. Schaefer has been with the company since 1935.

• **Arthur P. Hall** has been appointed director of public relations and advertising for the Aluminum Co. of America, Pittsburgh, succeeding **C. C. Carr**, who retires June 1, after serving 15 years in that executive capacity. Mr. Hall has been assistant director of public relations and advertising for Alcoa since 1947.

ARTHUR P. HALL, director of public relations and advertising, Aluminum Co. of America



WILLIAM W. EGE, vice-president sales, Wire & Cable Div., Copperweld Steel Co.

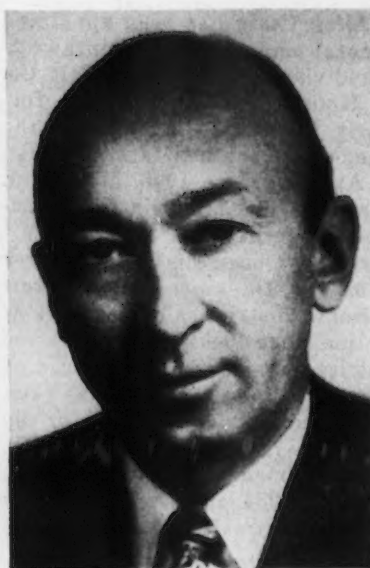
• **William W. Ege** has been promoted to the newly-created position of vice-president, sales, wire and cable division, Copperweld Steel Co., Glassport, Pa. He had formerly served as general manager of sales and prior to that had been in the company's Chicago office in charge of western district sales. **F. E. Leib** has been named assistant to vice-president, sales, and **P. A. Terrell** has been appointed assistant vice-president. Mr. Leib had formerly been assistant general manager of sales. Mr. Terrell had been assistant to the executive vice-president.

• **James G. Gunderson**, formerly purchasing agent, Federal Products Corp., Providence, has been appointed sales engineer in the New England territory. **Harlan E. Gilson, Jr.**, who has been assistant purchasing agent for the past 8 years, has been advanced to purchasing agent.

• **J. C. Bradley** has retired as a director and treasurer of the Apex Electrical Mfg. Co., Cleveland. **D. W. Randolph** has been named to succeed Mr. Bradley on the board of directors. **E. A. Linser** has been elected to succeed him as treasurer of the company. **J. D. Callahan**, who has served Apex for 17 years in cost, planning and accounting positions, has been named assistant treasurer and comptroller.



HOWARD J. DAVIS (left), assistant general manager, commercial steel sales and R. L. HANES (right), manager of sales, wire products, western division, Colorado Fuel & Iron Corp.



• **Howard J. Davis** has been named assistant general manager, commercial steel sales, western division, Colorado Fuel & Iron Corp., Denver. Mr. Davis came to CF&I in 1940 to establish a welded wire fabric division and prior to his new appointment had served as manager of wire products sales, western division. **R. L. Hanes** has been appointed manager of sales, wire products, succeeding Mr. Davis in that post. Mr. Hanes joined CF&I in 1929. He had recently been district sales manager at Fort Worth, Texas, for the company.

• **H. M. Denyes**, formerly sales engineer, has been made sales manager of Gemmer Mfg. Co., Detroit. He joined the company's sales staff in 1935.

• **Fred A. Jenness** has been appointed Detroit automotive sales representative of Clark Equipment Co., Buchanan, Mich.

• **Roscoe M. Smith**, newly appointed assistant director of the office of quality control of Ford Motor Co., Dearborn, becomes director of that office upon the retirement in July of **Richard Kroll**, present director, who has served 44 years with the company. Mr. Smith had formerly been general manager of the parts and equipment manufacturing division with headquarters at Ypsilanti, Mich.

• **Ralph P. Stilphen** has become associated with Diamond Alkali Co., Pittsburgh, as special technical sales and service representative for the protective coating field. Mr. Stilphen had previously been connected with France, Campbell & Darling, Inc.

OBITUARY...

• **Mason B. Peebles**, 40, vice-president and general manager, J. B. Kendall Inc., Norfolk, Va., died May 4.

• **Dana J. Fox**, 60, president and treasurer of Fretz-Moon Tube Co., Butler, Pa., died May 9.

• **Clarence W. Avery**, 67, chairman of the board, Murray Corp. of America, Detroit, died May 13.

• **Joseph O. Eaton**, 75, founder, Eaton Mfg. Co., Cleveland, died May 15.

• **S. B. Waring**, 60, secretary-treasurer, Morse Chain Co. Chicago, a Borg-Warner Corp. subsidiary, died May 11, in Ithaca, N. Y.

• **William H. Croft**, formerly president Magnus Metal Corp., and formerly vice-president and director, National Lead Co., died in Los Angeles recently.

• **John P. Starnes** has been transferred from the Orlando, Fla., branch of Southern States Iron Roofing Co., Savannah, Ga., to the New Orleans branch, as manager there. Mr. Starnes, who has been with the company 12 years, succeeds **R. R. Summerville**, who died. **A. J. Robertson** has been promoted to succeed Mr. Starnes as manager of the Orlando branch. Mr. Robertson has served 13 years with the firm. **Joseph M. Osborne** succeeds Mr. Robertson in Birmingham as sales representative, having been transferred from the Roanoke, Va., territory, where he had acted in the same capacity.

• **John G. Kirkpatrick** has been appointed sales representative in the Pennsylvania, New York and New Jersey area for Kieley & Mueller, Inc., North Bergen, N. J. Mr. Kirkpatrick had formerly been associated with the Bristol Co., Fischer & Porter Co. and the Koppers Co.

• **Paul W. Hoeper** has been elected to the board of directors of D. J. Murray Mfg. Co., Wausau, Wis., succeeding **J. S. Alexander**, who died.

• **Gerard F. Sheeran**, 33, vice-president and general manager, McCabe & Sheeran Machinery Corp., New York, died May 16.

• **Torsten J. Lindstrom**, 60, personnel director, engineering department, Koppers Co., Pittsburgh, died recently.

• **Frank L. Sackett**, 91, formerly operator of the Sackett Screen Co., Fredonia, N. Y., died May 14.

• **Thomas J. Wren**, 50, foreman of the Garwood, N. J., plant, Aluminum Corp. of America, died May 15.

• **Carl A. Franzen**, 61, works manager, Electric Boat Co., Groton, Conn., died recently.

• **George F. Bayle, Jr.**, 61, former president and general manager of Glens Falls Portland Cement Co., Glens Falls, N. Y., died May 15.

• **Bert L. Swett**, 67, retired vice-president and general sales manager, Lehigh Portland Cement Co., Allentown, Pa., died May 14.

FOR ALL MACHINERY MANUFACTURERS



Millions of KAYDON *precision needle rollers

*Tolerance on diameter .0002". On the Inspection Board shown above are KAYDON Needle Rollers .1250" diameter.

The success of KAYDON Precision NEEDLE ROLLERS in automobile and truck transmissions, universal joints, clutches, steering gears and other products, has led to their use in practically all types of machinery.

Since these needle rollers may be used between hardened shafts and hardened bores of housings or gears, they eliminate the need for bearing races. Thus they provide the most compact high-capacity anti-friction bearing possible, requiring little or no more space than so-called plain or "solid" bearings.

Millions of these precision needle rollers are being made in standard sizes, $\frac{1}{16}$ " to $\frac{1}{2}$ " diameters (tolerance .0002" on diameter), flat or rounded ends. Other sizes are being added as "standard" when quantities warrant.

By using standard sizes that are now in big volume production, you get the benefit of low cost for highest performance-proved quality in small or large quantities . . . but regardless of whether your machine design permits use of standard sizes or demands special needle rollers, contact KAYDON.

Be sure to state sizes and quantities when you send your inquiries.

Capacity also available now for all types and sizes of KAYDON Standard or Special Bearings. It pays to "contact KAYDON of Muskegon."

KAYDON Types of Standard or Special Bearings:
Spherical Roller • Taper Roller • Ball Radial
Ball Thrust • Roller Radial • Roller Thrust

THE KAYDON ENGINEERING CORP., MUSKEGON, MICH.

All types of Ball and Roller Bearings 4" bore to 120" outside diameter

European Letter . . .

• Iron and Steel Bill not adequately thought out . . . Too little experience in existing nationalized industries' workings and uncertain steel economic operating conditions make clear guidance difficult.



LONDON—The Iron and Steel Bill has completed its passage through the Commons, having for various reasons escaped the detailed, critical and systematic scrutiny which is due, whatever the party complexion of the particular Parliament, to any measure as far-reaching as this. This week it appears before the Lords, who will have to decide whether to reject it leaving the constitutional steamroller to roll or to embark on a serious attempt to amend and improve it. They will probably take the second course. The Bill offers ample scope for the kind of scrutiny and revision for which an Upper House is best fitted. A large body of public opinion will support this course. It is doubtful whether the public has been greatly roused for or against the Bill, but there is a widespread feeling that the Bill has not been properly thought out and is, even from the point of view of its authors, by no means satisfactory. Clearly the Bill has not been properly discussed in the Commons. Some time was devoted in the Commons to statistics of the number of speeches made on either side on second reading, in committee, and on the report. What matters is not the verbal expenditure but the ground covered. Some parts of the

Bill were obscured by tactical argument, some were dealt with hastily under immediate threat of the automatic closure, and some clauses escaped discussion altogether.

To public opinion it is not of great importance whether the inadequate discussion can most fairly be blamed on the government, on the opposition, or on both. It is probably true that the government was rendered careless by an opposition which is numerically and forensically weak. But it is also true that the House would have used its time better if the Bill had been steered by a government which had more than a rough and cloudy idea of what the Bill was to do and how it was to work. For this, it is fair to blame the government for having failed to think out the measure adequately in advance. The fact is that too little experience exists of the working of nationalized industries to give any clear guidance to an experiment in nationalization more complex and more hazardous than any other that has been attempted. The nationalized industries are only now encountering their serious problems; they are still at the stage of diagnosis, and have still to look for remedies.

Moreover, too many uncertainties surround the economic conditions in which the steel industry, whether it is nationalized or not, will have to operate. Leaving aside for the moment the desirability of taking the iron and steel and associated industries into public ownership, the scheme is too difficult to be undertaken by a govern-

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ment harassed (as the present government is) in so many ways by circumstances which it has no hope of being able to control. The consequences of this difficulty have been revealed throughout the proceedings. Whenever definition has seemed necessary, the government has had to cling to vagueness, and whenever the orderly processes of the human mind would have suggested the restriction of powers.

the delimitation of rights, or the formulation of duties, the government has had recourse to shadowy enabling clauses and expressions of confidence in the exercise of ministerial discretion. The committee proceedings contained dozens of examples of this. It has not been from choice, but from perplexity; the government genuinely does not know how a nationalized iron and steel industry can best be run, on what principles its trading will require to be conducted, or what constitution will give it the best chance of effectively serving the national economy. It has therefore felt obliged, at all points of doubt, to hedge.

THE first, and in many ways the essential, matter which needs to be settled is the relation of the publicly-owned iron and steel industry to industry at large. The Bill will set up a monopoly which promises to be impregnable, defended not merely by the opportunist and transient safeguards which have protected the privately-owned steel industry, but by statutory powers and legal prohibitions. Outside its central monopolistic activity of iron and steel production, the Iron and Steel Corporation will be engaged through its subsidiary companies in a many-sided competition with industry at large. It is probably reasonable, therefore, to begin by defining the Corporation itself and its relation to the publicly-owned companies which it is to take over. This was one of the first major issues which arose to be settled in the Commons, and it has not been settled yet. It is true that the government redrafted Clause 2 (which defines the powers of the Corporation) to make it clear that the Corporation is to be primarily a holding company, a controller and director of activities rather than a directly trading concern. But, even then, during the process of definition, ambiguity took charge and a saving condition was added:

The Corporation shall have power, with the consent in

"RELIANCE OK" .. P. A.

"On several occasions we would have had to discontinue operations were it not for the timely arrival of steel from Reliance."



Quotation Reproduced From A Letter in Our Files

Steel Plentiful or Scarce .. Reliance Service Clicks with Sheet and Strip Steel Buyers



DEPENDABLE DAN
OUR CUSTOMERS' MAN

Here is Reliance Service in action from the P. A's angle ... in his own words.

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Reliance is constantly planning and working toward greater production and supply . . . towards higher standards of steel service.

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STRIP STEEL—Cut Lengths . . . SHEETS—Hot Rolled . . . Hot Rolled
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writing of the Minister, to carry on any other activities which, at the time when the consent is given, and publicly-owned company is authorized as aforesaid to carry on.

Situations are easy to foresee in which the Corporation, in its capacity as a holding company, can disclaim responsibility for the activities of individual companies when responsibility would be embarrassing. But in its other capacity it will be able to do anything which it and the Minister of Supply may please; for the activities covered by the articles of association of the companies scheduled for public ownership are almost countless.

The Bill has failed at this definition. What of the next, and vital, definition: the relationship of the Corporation to the consumers of iron and steel products—that is, to industry? This calls in question the purpose and ultimate justification of the Bill, which ought to be in the provision of enough good steel products as cheaply as possible for all who need them. In its original form the Bill was completely meaningless on this point: the Corporation was to exercise its powers to secure that iron and steel were available in the quantities and qualities and at such prices “as may seem to the Corporation best calculated to further the public interest in all respects.” This formula was dropped in committee, and a new one substituted: the quantities, qualities, and prices must be such

as may seem to the Corporation best calculated to satisfy the reasonable demands of the persons who use those products for manufacturing purposes and to further the public interest in all respects.

This, though not entirely mystical, contains two roomy escape clauses: “as may seem to the Corporation” is one; “and to further the public interest in all respects” is another.

Quite apart from this, industry needs some assurance against preference and discrimination—for the customers of the publicly-owned undertakings for iron and steel will also be their competitors in engineering and other products. The consumer's status in relation to the nationalized steel industry is a matter of far greater difficulty and

importance than his relation (which has still not been satisfactorily established) to the other nationalized industries. Clause 3, which attempts to define the “general duty” of the Corporation, now admonishes it

to avoid showing undue preference to, and exercising unfair discrimination against, any such persons or any class thereof in the supply and price of these products.

“Undue” preference and “unfair” discrimination are themselves question-begging terms: when is preference “due” or discrimination “fair”? But, lest this may bind the Corporation too closely, there is a further escape clause:

but without prejudice to such variations in the terms and conditions on which those products are supplied as may arise from ordinary commercial considerations or from the public interest.

Here again, the Corporation gets the best of both worlds. If a transaction is unprofitable, the Corporation can invoke “commercial considerations” and refuse it. It can alternatively invoke the public interest and undertake it. But what are the consumer's rights? Has he an enforceable right to a supply of steel? Apparently not. Can he claim redress against discrimination, or object to preference being shown to perhaps a publicly-owned competitor? It seems unlikely. Indeed, by a further refinement of loose wording, it is upon the Corporation alone that the general duty of avoiding these evils is placed: the actual trading body, the publicly-owned company, does not appear to be made answerable. As debate in the Commons showed, it may happen that a consumer fails to get reasonable service and is still unable to show that the Corporation is to blame; the blame may lie lower down in the new hierarchy, and it is doubtful whether the consumer will have any redress.

IN the light of such considerations as these, the proposed Iron and Steel Consumers' Council assumes great importance. Clause 6, which provides for the appointment and constitution of the consumers' council and committees, has been redrafted by the govern-

ment and rendered far more specific than in the original bill. The powers of the council will, on present form, be shadowy; it will still be largely under ministerial control, and will depend on the Corporation for such things as its office accommodation and its out-of-pocket expenses. But with an energetic chairman, and under a helpful Minister, it should now be able to fight a useful rearguard action on the consumer's behalf.

Such privileges as the Bill offers to the consumer of steel, or, indeed, to any private person or private undertaking, are qualified and hypothetical; they will depend on the goodwill of the Iron and Steel Corporation and the discretion of the Minister of Supply. In contrast, the rights and powers given to the Corporation and the Minister are wide and unassailable. It has already been pointed out that the Corporation will be legally able, so long as it has the Minister's consent, to engage in any of a host of trading activities, some of them far removed from the basic task of producing iron and steel. But massive safeguards are erected against the possibility that private firms may reverse this process and encroach on the scheduled activities. This frightful danger is attacked in two ways, one dealing with firms already established as iron or steel producers, and one dealing with new entrants; the distinction is itself significant.

The Bill makes it an offense to get iron ore, smelt iron, make steel ingots, or engage in the hot rolling of steel to the extent of more than 5000 tons a year without a license from the Minister of Supply. But firms which already make these scheduled products will be entitled to a license to go on making them within narrow quantitative limits. The limit will be twice their average rate of output in 1946-47, or 20,000 tons of iron or steel (in the case of iron ore, 50,000 tons) a year, whichever is the less. The Minister has power to raise these limits for individual firms. He did say in the committee proceedings that he would almost automatically raise the limit to a reasonable extent for a firm already producing nearly 20,000 tons a year where the firm could show good technical grounds or economic advantages.

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BY USING DEEP DRAWING STAINLESS STEEL

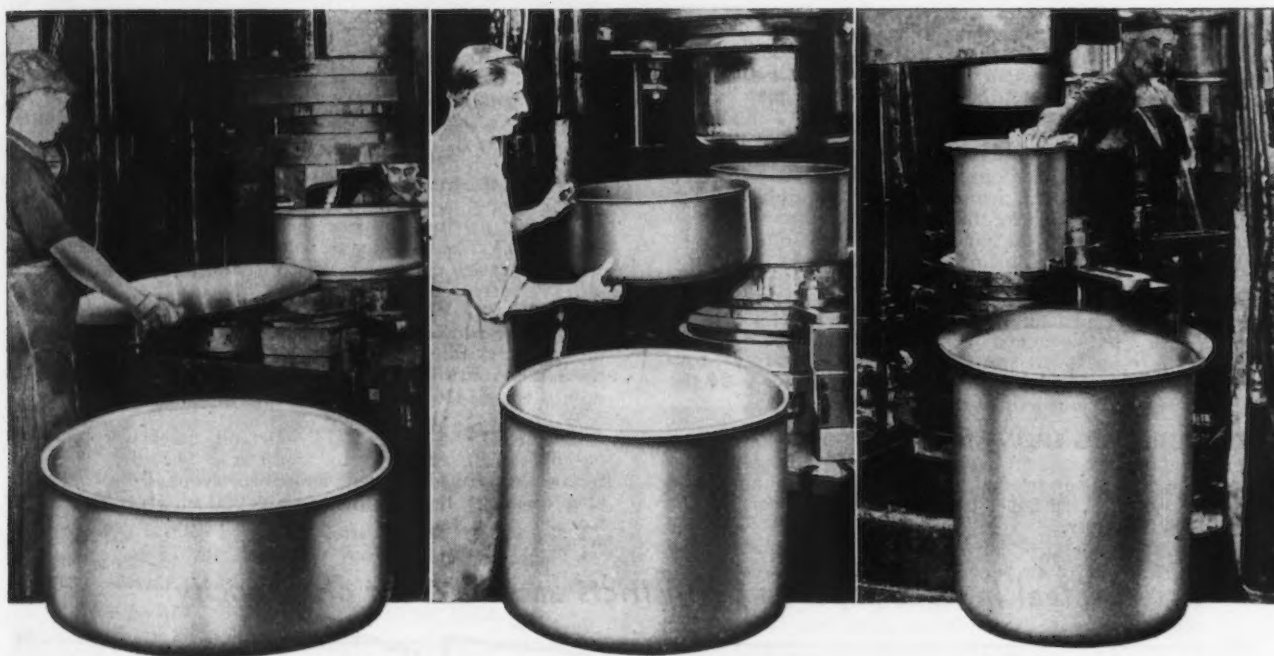
To fabricators of austenitic CHROMIUM-NICKEL stainless steel the properties of this metal offer:

- Ability to take severe deformation without rupturing.
- Ability to retain toughness despite a deep draw. Final stress relief may often be omitted.
- Ability to provide smooth, corrosion-resistant surfaces, easy to clean and keep clean.

● Ability to cut bulk and deadweight from a product without sacrificing strength or durability.

Products formed of these silvery white steels impress one instantly with their beautiful "stainless" satin finish that adds to their sales value.

Leading steel companies produce austenitic chromium-nickel stainless steels in all commercial forms. A list of sources of supply will be furnished on request.



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Lalanc and Grosjean Mfg. Co., Woodhaven 21, New York, producers of Crusaderware, start with a circular blank of stainless steel .056" thick, such as the man holds, at the left. First draw produces the form pictured above.

The second draw results in the above part. Hydro-Dynamic Presses, produced by E. W. Bliss Company of Detroit, are used for both first and second draw. They provide controlled speed and pressure at full length of stroke.

A mechanical double-action press makes the final draw, and the resulting product comes out with a beautiful, smooth surface that resists corrosion, wear, impact and abrasion.



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THE INTERNATIONAL NICKEL COMPANY, INC. 67 WALL STREET
NEW YORK 5, N. Y.

• **NO PENSIONS?**—Carnegie-Illinois Steel Corp. has agreed to meet with United Steelworkers on June 15 to begin negotiations on wages and social insurance benefits, but not on pensions. In replying to Steelworkers letters on these subjects Carnegie president Charles R. Cox said he regretted the union desire to reopen the wage agreement now in view of the downtrend in living costs and current business uncertainties. The present agreement, he pointed out, does not provide for reopening on pensions and the steel company accordingly considers irrelevant the union's request to discuss them.

• **PRICE CHANGES**—Effective May 16 Atlantic Steel Co., Atlanta, reduced base prices and extras on bars and strip. Merchant bars and bar size angles are now \$3.50 per 100 lb; hot-rolled strip is \$3.40 and new billet deformed reinforcing bars are \$3.50. The Jan. 1, 1948 extra list replaces that dated Dec. 20, 1948. The 10 pct increase for hot dip galvanizing of the company's bars, shapes and hot-rolled strip, made Aug. 16, 1948, is cancelled. Wire products prices were also revised.

• **CHAINMAKERS SUED**—Eight manufacturers of malleable iron chain and their trade associations have been charged by the Federal Trade Commission with combination and conspiracy to fix prices and otherwise suppress competition. The trade association is Malleable Chain Manufacturers Institute, 11 S. La Salle St., Chicago. Among devices used to implement an alleged agreement, the complaint cites a freight allowance plan and a "price leadership plan."

• **FOUNDRY DIP**—A reliable estimate puts foundry operations in the Pittsburgh district at a level about 60 pct below what they were a year ago. Merchant furnaces supplying the area are building up iron stocks. Pittsburgh Coke & Chemical Co officials believe that within a few months they'll have enough inventory on hand to supply customers while the stack is off for relining this summer.

• **ONE JUMP AHEAD**—Dollar volume of April retail sales (15,000 large independents reporting) was 1 pct ahead of April 1948, a 5 pct recovery over March this year. Automobile sales were up 16 pct from a year ago and hardware up 11 pct. Building material dealers were thrown for a 24 pct loss from last year but gained 6 pct over March.

• **EASTERN PIG IRON**—In a bid to enter the eastern iron market despite current high freight rates, Republic Steel Corp. is beginning the production of basic and foundry iron at its Troy, N. Y. furnace, heretofore a producer of low phosphorus iron only.

• **ORE REPORT**—U. S. and Canadian blast furnaces consumed 7,321,856 gross tons of Lake Superior district iron ore in April, according to Lake Superior Iron Ore Assn. This compares with 7,734,760 gross tons in March and 4,976,069 tons in April, 1948. April consumption raised cumulative consumption this year to date to 29,639,512 gross tons, compared with 25,107,565 tons at corresponding date last year. Active blast furnaces depending principally on Lake Superior district iron ore numbered 175 U. S. and 9 Canadian. Ten U. S. blast furnaces and one Canadian blast furnace were idle.

• **RHUBARBS**—Slowdown rhubarbs continue to hamstring Detroit auto production. On two consecutive days last week more than 2000 workers walked out of Midland Steel Co. protesting disciplinary layoffs handed 120 men for alleged slowdown. Company charges men failed to meet production standards. Union charges production standards are too high.

• **WIRE MARKET**—The Eastern wire market is very competitive, with several western producers absorbing freight on manufacturers wire and wire rods. One western producer has established a mill warehouse at Haverford, just outside Philadelphia, which is warehousing poultry netting and lawn fence.

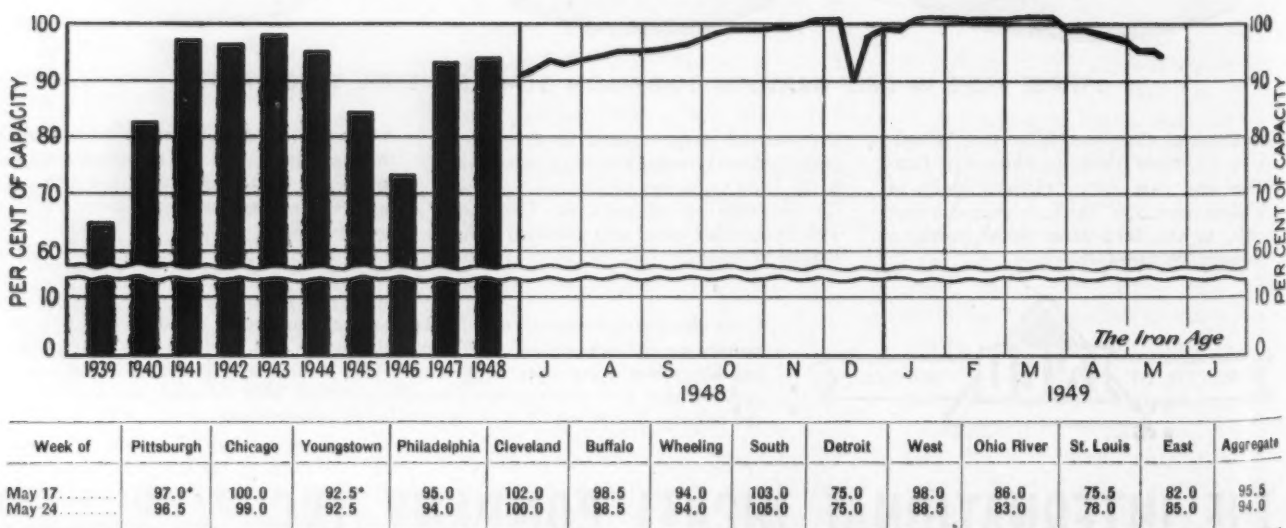
• **EXPENSIVE**—It cost Kaiser-Frazer \$4.1 million in dealer refunds to make its recent price reduction ranging from \$198 to \$333 per car, according to Edgar F. Kaiser, president. During first quarter company lost \$5.8 million. Mr. Kaiser says sales are now 2½ times weekly average during first quarter.

• **WAREHOUSES PRICES**—Warehouses in Philadelphia have reverted to the delivered price system for shipment of some steel products outside the free delivery area. On cold-rolled and galvanized sheets, cold-finished bars and alloy bars, warehouses are equalizing with Pittsburgh and Baltimore.

• **BACK TO WORK**—The spring upturn in construction put 127,000 workers back on the job in April to bring the total building employment to 1,965,000—some 32,000 above the same month last year. New work put in place during the month was \$1370 million—up 10 pct above last April.

• **DETROIT STRIP CUT**—Detroit Steel Corp. has cut its cold-rolled strip price by \$5 a ton to \$4.25 per 100 lb. Effective May 23 McLouth Steel Corp. dropped its cold-rolled strip quotation to \$4.20, the same as that of Great Lakes Steel Corp.

Steel Ingot Production by Districts and Per Cent of Capacity



*Revised.

Industrial News Summary—

- **Steel Market Becomes Confusing**
- **Inventory Cutting In Full Swing**
- **Auto Industry Still Bright Spot**

FACTORS are confusing and irritating to some people in the steel market this week.

A placid or wishful thinking attitude on the outlook does not jibe with the facts. Current output and backlogs are good for July at least. Beyond that point the situation is taking on a pattern which is looking more and more like 1937-38. Then orders dried up overnight and customers went on a hand-to-mouth buying slowdown.

There is no longer any doubt that steel consumers are in the midst of a serious paring down of inventories. Some users started to do this some time ago. But the great majority are now in the process. Just how far they will go in taking a gamble with lower stocks is anyone's guess. But steel users are wary of prices even though there are no signs of a break. They don't want large stocks if a break should come.

There are many in the steel industry who feel it is not safe for customers to let their stocks get so low that they would be caught short in case an upswing develops in general metalworking business. A lot of steel users have been carrying large supplies and have been buying on a 60 day basis. All this is changing rapidly.

The reason it is changing is simple. Inventory looms large or small depending on the size of incoming orders for finished manufactured items. It is also affected by the flow of steel from the steel mill. This week many steel consumers are finding (1) orders for their products are continuing to fall off, (2) their inventory reduction program is not keeping pace with the drop in new business and (3) steel orders placed some time ago are rolling into plants on time.

This situation is balanced against possibility of (1) a serious labor tieup in steel and coal, (2) a pickup in general business or (3) governmental anti-deflationary moves. Some steel consumers weighing the matter have found their answer in cutting inventory to the bone. They have also started to fill orders when and as they come in, thus reducing their steel buying habits to a short period. This they can do more each day as all steel items become more easily available.

Cancellations with some companies and on some products have slowed up in the past week, although this condition is not uniform. Others find cancellations still running high compared with incoming orders.

STEEL people view the situation this week with some private anxiety. They are not worried about steel output for the immediate future. But they are afraid that in the process

of trimming inventories the trend may gather too much momentum on the downside. Most of the caution about conditions later this year springs from steel men who have been through three deflationary periods since 1920. A lot of the optimism over the ability of business to hold up generally—without dipping sharply—comes from steel people who are comparatively newcomers on their jobs. No one in or out of the industry seems to expect a real and lasting depression in steel.

There are always a few straws in the wind which turn into a general condition later. This week some steel users are adopting—where they can—a practice of ordering no more than 30 days ahead or less. They are matching their steel orders closely with demand for their products. This practice can only be applied to the steel products which are easier to get, such as hot-rolled bars, cold-finished bars and in some areas sheets.

Such customers are attempting a three-way caution; (1) they are cutting inventories, (2) they are cancelling steel mill tonnages placed too far in advance and (3) they are trying for the earliest delivery on material which they need in a hurry because of their actions (1) and (2). Fortunately for the steel industry such buying habits are not widespread.

AUTOMOTIVE steel demand is the brightest spot in the steel market. Its gleam is getting a little duller because of Ford Motor cancellations. Ford has stopped delivery on as much steel as possible. Orders for all steel, not in transit or in process, have been suspended. This means that steel mills receiving such suspensions must find new customers to take up the slack on the rolling mill schedules which already had been set up.

Demand for parts for new cars is still strong, but demand for spare parts has been falling off recently. This has been reflected in steel order volume from auto parts makers. The increase in the percentage of new or comparatively new cars on the road has cut down the volume of repair and replacement parts after a 3-year whirlwind upswing.

This week THE IRON AGE steel scrap composite price decreased 67¢ a gross ton to \$22.08 per gross ton. The decrease was caused by a drop of \$2.00 per ton on No. 1 steel at Chicago. Since the first of the year the scrap composite has plummeted \$20.92 per gross ton. Steel ingot output is down 1½ points to 94 pct of rated capacity. Next week some tonnage may be lost because of Memorial Day.

"King Size" Power-Shovel Bucket made of **J&L HEAT-TREATED JALLOY STEEL** still going strong after full year's gruelling service!

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of earth and rock in one "scoopful." This monstrous power-shovel bucket excavates 10 acres to a depth of 50 feet in a month.

Working day and night it removes overburden on a large strip mining operation in southern Illinois. As it digs its way through some 15 feet of limestone, 15 feet of shale and 20 feet of clay, it is subjected continuously to severe abrasion and impact.

Yet the J&L heat-treated JALLOY

STEEL on the bucket has given more than a year of service!

To date more than 6,000,000 cu. yds. have been excavated, but the excellent appearance of the J&L heat-treated JALLOY STEEL indicates a reasonable expectancy of many more months of service before replacement is necessary.

J&L heat-treated JALLOY STEEL was developed for just such uses as this—where steel must withstand extreme abrasion and heavy shock for long periods of time. Its outstanding wear-resistant properties make it especially useful for

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Allegheny County Enacts Law to Control Smoke and Fly Ash

Pittsburgh

••• Allegheny County's smoke control ordinance enacted May 17 is expected to be a model for many industrial areas that do not have such laws now. The new law differs from that which is in effect in the city of Pittsburgh in that it says in effect, "Don't make smoke!" but leaves details on how to avoid it up to the individual. Neighboring counties are considering similar legislation; so is the city of Youngstown.

The ordinance was prepared after more than a year's work by an advisory group headed by Dr. Edward R. Weidlein, of Mellon Institute, and including key executives from almost every major industrial company in the county. It will be effective by June 1, 1949.

Basis of the law is density No. 2 of the Ringelmann Chart. With a few exceptions such as breakdown of cleaning equipment, firing or cleaning boilers, the discharge of smoke darker than shade No. 2 of the chart is illegal.

Even before the ordinance was passed, Thomas C. Wurts, director of the county's Bureau of Smoke Control, reported that the steel industry had taken effective voluntary action to clean up its stacks. A joint research committee consisting of engineers of Jones & Laughlin Steel Corp., National Tube Co. and Carnegie-Illinois Steel Corp. has made "outstanding progress in methods of sampling and testing stack emissions," Mr. Wurts said.

Other steps that will cut down on smoke include: (1) Appropriation of \$100,000 for a pilot plant at the Etna ferromanganese furnaces of Carnegie-Illinois; (2) two new sintering plants at Carnegie's Edgar Thompson Works and at Carrie Furnace; (3) additional new coke ovens at Carnegie's Clairton Works.

Pittsburgh Coke & Chemical Co. is working on a device to control the smoke that comes from blast furnace safety valves when there is a slip in the furnace. The device is not perfected yet but a company spokesman said progress "looks encouraging."

Replacement of steam loco-

"Model Law" Represents Years' Work by Citizens' Group; Steel Mills Helping

By GEORGE F. SULLIVAN
Pittsburgh Regional Editor

tives by diesels, a matter of simple economics, is also reducing smoke in the area. It is forecast that within the next 2 years nearly all steam switchers in the district will be replaced by diesels.

In the city of Pittsburgh, Jones & Laughlin has scrapped a number of old boilers, replacing this capacity with a new boilerhouse with 5 boilers each generating 175,000 lb

of steam per hr. Its dust collectors are well within the limits of present laws. J&L has put cleaning equipment on its sintering plant and modernized the combustion systems of billet heating and similar furnaces.

Utility companies in the county are installing mechanical dust collectors or electric precipitators to clean their boiler gases and a number of industrial firms have installed new combustion controls and dust collectors. National Tube is among the plants erecting a modern boiler house with gas cleaning and fly ash removal equipment.

Specific sections of the law vary according to the facilities involved. Some of them include:

Central station and industrial power and heating plants: Fly ash

Smoke Signals





THIS WILL STOP: *The steel industry's contribution to the smog that used to blanket Pittsburgh has been exaggerated, as this old photo shows. It was taken at 10:30 a.m. Jan. 24, 1946, during the big steel strike when district furnaces were operating at 3 pct of rated capacity. Smoke like this from smaller furnaces has since been curtailed by city law and the new countywide ordinance will further improve conditions. The Hotel Henry, left foreground, is now being scrapped to make room for a Mellon-U. S. Steel skyscraper.*

not to exceed 0.85 lb per 1000 lb of gases adjusted to 50 pct excess air in the products of combustion, except that not more than 85 pct fly ash elimination is required. Industrial plants will have until July 1, 1950, to comply with the smoke regulation and 5 years to control fly ash.

Blast furnaces: New or completely rebuilt units must be equipped with gas cleaning devices to reduce fly ash to not more than 0.50 lb per 1000 lb of gases though removal need not be greater than 85 pct of total fly ash. Such furnaces must have bleeders so arranged that gases will be cleaned before discharging to the atmosphere. Present furnaces are given 10 years to comply with the above rules. Research on devices (see above) to control smoke during slippage of the burden must be started.

Byproduct coke ovens: Must use those means of controlling smoke and fly ash "which have been proven to be economically practical."

Openhearth and bessemer:

Openhearth is required to incorporate "economically practical" controls. The law recognizes the amount of work still to be done along these lines. It requires openhearth and bessemer converter operators to do research to determine control techniques. It allows 5 years for this work, subject to further extension. This research is now under way.

Other facilities: Separate sections covering heating, reheating and puddling furnaces and cupolas generally limit fly ash to 0.85 lb per 1000 lb of gases, except that removal of more than 75 pct of total

fly ash is not required. There are some exceptions to the overall No. 2 Ringelmann smoke rule on heating, reheating and puddling furnaces. Such furnaces or cupolas contracted for, under construction or in operation prior to enactment of the law are given 5 years to comply.

Although there are no beehive coke ovens now operating in Allegheny County the law specifically bans them. Neighboring counties have such ovens but their life is believed to be doomed by economics. The law also covers railroads, river tugs and other sources of smoke.

Mine Subsidy Question Again Before Congress

Washington

• • • Legislation authorizing federal subsidy payments to operators of submarginal copper, lead, and zinc mines was voted by the House Public Lands Committee this week. Outlook for passage of such legislation is anything but bright, since Interior Dept. has gone on record as being opposed to the bill (H.R. 976) sponsored by

Representative Engle, D., Calif., and President Truman has stated his opposition to all subsidy legislation of this type. Engle's bill would provide \$100 million a year for subsidies during the next 5 years. How much copper, lead, and zinc would be needed for defense stockpiling would be decided by the Munitions Board. Similar legislation is before the Senate.

Republic Teaches Basic Steelmaking In Novel Public Relations Experiment

By TOM CAMPBELL
News-Markets Editor

Cleveland

••• A lot of steel people know their public relations depend on what the working press does or doesn't do with steel news. They also know the industry is complex and big. But it is in the news more than any other basic industry. Steel people feel they don't always get a fair deal. Whose fault this is supplies plenty of argument.

Last week Republic Steel did something simple about public relations. Some of the fourth estate might have termed it corny. But then they were not on the well-planned, slogging and backbreaking junket through, not one, but many of Republic's plants.

There were no fancy handouts. There were no "firsts." There were no long and laborious speeches. There was no unseen pressure to "file a story." If that pressure were there it came from the news-men's bosses, not from Republic.

The trip lasted 5 days. Not all the working press stayed with the party to the end. Many did. The news wasn't what was seen, but what was done. The junket covered steel from ore to steel locker, with nothing missed in between.

At the end of each day all questions which were not taken care of during the plant tour were answered. The idea was that Republic hoped the 30-odd newspaper people would go away from their plants knowing what an ingot is. What steel is. What scrap is used for. How a blooming mill works.

The idea worked slick as a whistle. Technical editors sputtered over future stories. Daily newsmen saw—many for the first time—what they had been writing about for a long time. Editorial writers got a first hand picture of steel's arguments which have usually run counter to dispatches from Washington. Propaganda was at a minimum. The only handouts were pictures of basic steel operations and a complete booklet telling, in simple language, how steel

is made—from ore to finished steel product.

The job was gigantic to schedule. No plant operations were interfered with by the tours. But what did Republic hope to get by this tour of all its most important operations? The answer is simple. It is the reason why the whole project was successful. Republic hopes the next time any of the people on the trip write about steel they will remember what they saw and how it shaped up in the raw.

Then Republic probably hopes the writer will remember that Republic made the eye-opening trip possible

—that somewhere in the yarn that fact will be mentioned.

This trip was a big gamble. It was long. It was grueling. It was informational. As Charlie White said in his invitation, it was kind of a post graduate course on steel-making.

Results can only be intangible. Republic will never know with certainty how much good it did the industry, or Republic. Ed Bowerfind and Henry Hopwood, public relations men who cooked up this deal, will always be vulnerable if asked to prove a return on the investment. Yet it was so simple an approach to better public relations that it can't miss. The working press are still the guys between steel and the public when it comes to the last word.

UE-CIO Requests GM to Set Base for Contract

Detroit

••• General Motors has declined to comment on a report that the United Electrical Workers (CIO) has requested the corporation to put a new floor under its wage contract. The UE-CIO contract is identical with the UAW-CIO wage contract.

According to available reports, the UE is proposing that the 11¢ pay boost granted last year would be held for GM workers regardless

of how far the cost-of-living index may drop.

Another wage adjustment under GM's sliding scale contract is due within 2 weeks and some observers have predicted a slight drop in the GM wage scale will result.

Following a contract increase of 11¢, GM wages were increased another 3¢. The next cost-of-living adjustment called for a 2¢ reduction. Under the GM contract a floor of 6¢ is provided.

NEW TOP CHARGERS: Second of 2 new 60-ton Pittsburgh Lectromelt top charge electric furnaces has recently been installed at Rotary Electric Steel Co., Detroit, bringing the company's melting capacity to 420,000 ingot tons annually. Rotary's postwar expansion program includes the installation of a 30-in. mill, rebuilding of a 28-in. blooming mill and the installation of a 36-in. blooming mill.



Industrial Briefs . . .

• **A GIFT**—A \$10,000 die casting machine has been given to the metallurgical engineering department at Illinois Institute of Technology by the Doehler-Jarvis Corp., New York. The corporation plans to give three similar machines to other institutions in the near future.

• **SAFETY FIRST**—Employees of H. H. Robertson Co., Ambridge, Pa., producers of protected metal for roofing and siding, have received a second-time Accident Prevention award for a continued outstanding industrial safety record.

• **BUDD BUYS RED LION**—The Budd Co. has announced the purchase, for \$5,250,000 from the WAA, of the Red Lion plant in Northeast Philadelphia which it had under lease since the end of the war. They will continue using the plant for the production of all-stainless steel railroad passenger cars, stainless steel truck trailer assemblies and railway disc brakes.

• **FOUR IN ONE**—Norton Co., Worcester, has recently established a new district in the St. Louis area in charge of R. O. Anderson, who will shift his headquarters from Denver to St. Louis. This district will include the Rocky Mountain and South Central districts, now discontinued, and two areas formerly in the Chicago district.

• **TRANSFER**—To further improve its services to shielded arcwelding electrode users, the McKay Co. is moving its Electrode Sales Dept. from York, Pa., to the company executive offices in the McKay Bldg., Pittsburgh.

• **MINING IN BRAZIL**—J. L. Harper & Co. and the Commercial Drilling Co. have formed the Cia Perfuracoes Comerciais S.A. with headquarters in Rio de Janeiro. Plans for the Brazilian purchase, for \$5,250,000 from concern include exploratory drilling and complete engineering services, geological reports and mineral analyses.

• **GROWING**—The Rose-Moskowitz group of Cincinnati has acquired the physical assets of the Whitney Steel Corp., Indianapolis, producers of sheet steel and corrugated metal. The syndicate intends to continue operating the Whitney mill which has a book value of \$1,200,000.

• **SPROUTING WINGS**—The Bell Aircraft Corp. has formed a wholly-owned subsidiary, Bell Aircraft Supply Corp. at Burbank, Calif., to handle sales and service of helicopters and parts on the West Coast and also helicopter field operations, including oil surveys, in Louisiana and Texas. David G. Forman is president, David F. Devine, secretary, and Harvey Gaylord, treasurer.

• **READY TO SERVE**—C. E. Smith, 414 Union Savings & Trust Bldg., of Warren, Ohio, has organized the Resistance Welder Engineering Co. for making available a consulting engineering service on resistance welding, power supply problems and power factor correction.

• **EXPORT SALES**—C. O. Bartlett & Snow Co., Cleveland, designers and builders of foundry industry equipment, has appointed R. K. Price Associates, Inc., 70 Pine St., New York, as exclusive export sales representative.

• **MORE ROOM**—Whitman & Barnes has moved from its old location in Detroit to its new home at 40600 Plymouth Road, Plymouth, Mich.

• **NEW BUSINESS**—William Frost, treasurer of P. W. Bowers Co., Inc., will head the Wm. Frost Co., Inc., 30 Church St., New York, as of June 1. Mr. Frost joined the Bowers Co. in 1938, has been managing its affairs for the past year.

• **GEAR SALES**—Farrel-Birmingham Co., Inc., Ansonia, Conn., has announced an association with C. A. Lapp & Co., Cleveland, who will handle the sale of Farrel gears and gear units in Cleveland.

Fairless Warns Costs May Rise, Prices Drop If Sales Dip Continues

Pittsburgh

• • • U. S. Steel President Benjamin F. Fairless last week warned that steel costs might go up if demand continues to soften, while prices might fall. He gave the first clue to big steel's position on 1949 wages in pointing out in this connection that wages were a part of steelmaking costs and couldn't be considered apart from them.

Addressing the chamber of commerce of Homestead, Pa., where U. S. Steel has one of its biggest plants, Mr. Fairless reminded his listeners that real wages rose 25 pct between 1939 and 1948. Commenting specifically on the wage, cost price relationship, he noted the present relaxation in steel demand. "If this becomes more pronounced," he warned. "The economies made possible by high volume may disappear and costs may rise. At the same time competitive pressure may drive down prices. Costs and prices are hard facts which must be faced. Wages are part of costs and cannot be considered apart from them."

"Steel demand is still good," he said, "and though I do not pretend to be a prophet, I am not discouraged by the outlook. . . short-term developments make it easy to lose one's perspective, and for that reason I believe we should view the future calmly and with confidence."

He remarked that U. S. Steel was not relying too much on relocation of plants to overcome the F.O.B. problem. "Our sales forces have been streamlined and are scouring their territories for orders. . . . Our sales force is working and working hard, using all the facts that research and study can uncover to make their efforts more effective."

Resumes Sinter Production

Toronto

• • • The Algoma Ore Properties' plant at Wawa, Michipicoten district, resumed regular production at the end of April, following the winter shutdown. The company's expansion program is making good progress and this year should see output substantially increased as production is worked up to an immediate objective of an annual output of 1 million tons of iron sinter.

Changes Base Prices Carbon, Alloy Steel Ingots, Billets, Slabs

New York

• • • Reflecting adjustments in commodity export rates of freight effective May 16, 1949, the U. S. Steel Export Co., U. S. Steel subsidiary, announces the following new base prices with freight included to New York, Philadelphia or Baltimore.

These prices will apply on carload lots and are effective with shipments from the mills on and after 12:01 a. m. May 16, 1949. All prices are base and subject to seller's current lists of extras and conditions of sale. All prices are net cash. All sales are subject to seller's prices in effect at time of shipment.

CARBON STEELS	
Prices per net ton	
INGOTS	
Rerolling quality	\$64.45
Forging quality	65.45
BILLETS, BLOOMS AND SLABS	
Rerolling quality	67.45
Forging quality	76.45
Tube rounds	91.45
RAILS	
Standard, 61 lb and over	81.65
Light, 60 lb and under	86.36
ALLOY STEELS	
INGOTS	
Forging quality	66.45
BILLETS, BLOOMS AND SLABS	
Forging quality	78.45

OIT Raises Coke Quota

Washington

• • • Office of International Trade has set the third quarter export quota for metallurgical grades of coke at 50,000 tons, an increase of 30,000 tons over the quota for the second quarter.

License applications for third quarter shipments of metallurgical coke may be filed with OIT any time during the quarter. Coke other than metallurgical grades is not under quantitative export quotas and applications for licenses may be filed at any time.

C-I Announces New Steel

Pittsburgh

• • • A new bessemer steel bar stock just announced by Carnegie-Illinois Steel Corp. is reported to machine 20 pct faster than comparable standard bessemer steels. Called USS "MX" Free Machining Steel, it sells for \$3 a ton more than the standard bessemer bar steels.

"MX" Free Machining Steel was developed to get faster machining

What Happened?

Birmingham

• • • What happened to a carload of scrap iron reported to have been shipped to Birmingham from Florida more than a year ago is the issue in a suit for damages filed in U. S. District Court here.

Contending that the scrap never was delivered, Charles Temerson & Sons, Tuscaloosa scrap dealers and brokers, filed suit against the Seaboard Airline Railroad. Damages of more than \$3000 are asked.

The suit maintains that the material, consigned to McWane Cast Iron Pipe Co., Birmingham, was loaded on a train at Tampa, Fla., Apr. 10, 1948.

Jerome Cooper, attorney for the plaintiffs, said the scrap "seemed to have disappeared in thin air."

characteristics than B-1113 steel and to increase tool life. It has been under development by Carnegie for more than 5 years. Though it is known to be in the lower carbon ranges, details are not being released because a patent application on it is still pending.

Extensive test runs have also shown that the new steel performs well in operations such as forming or crimping the machined parts, the company reported. It is available from Carnegie-Illinois in hot-rolled bars and cold finishers will sell it in cold-finished bars.

Heads Blair Steel Co.

New York

• • • Thomas S. Blair has been elected president of Blair Strip Steel Co., New Castle, Pa. He succeeds his father, the late George D. Blair, Jr., who founded the company in 1924.

After graduating from Williams College, Williamstown, Mass., Tom Blair was engaged in research on the Manhattan Project at Columbia University in New York. Later he did research work at Oak Ridge, Tenn.

For the past 2 years he has been Associate Editor of THE IRON AGE.

Foremen Tour Plants

Youngstown

• • • Inspection tours of General Fireproofing Co. and Republic Steel Corp. plants featured the annual spring conference of the Mahoning Valley Foremen's Assn. here recently.

Suspends Pig Iron Allocations Under Voluntary Program

Washington

• • • Suspension of pig iron allocations under the voluntary plan covering the manufacture of cast iron residential housing items has been announced by the Office of Industry Cooperation, U. S. Dept. of Commerce.

The voluntary plan itself, however, will remain in effect to permit the resumption of allocations should a change in supply conditions warrant such action. Present expiration date of Public Law 395 as amended, which authorizes the Voluntary Agreements Program, is Sept. 30, 1949.

Before taking this action, OIC polled all participating manufacturers of cast iron residential housing items to determine whether there was a need to continue pig iron allocations. Results of the poll indicated that a continuation of allocations under the voluntary plan was unnecessary. Domestic supplies of pig iron are plentiful at this time, OIC said.

The voluntary plan providing pig iron for residential housing items became effective in July 1948, and made available approximately 100,000 tons of pig iron monthly for the manufacture of such critical items as: cast iron pressure pipe and fittings, oil pipe and fittings, plumbing drainage products, low pressure boilers and iron castings for warm air furnaces.

United States Exports Increase During March

Washington

• • • United States world trade rose \$187 million in March, according to Census Bureau reports. Exports increased \$123 million to a total of \$1152 million while imports for consumption rose \$64 million to bring the monthly figure to \$632 million.

Increases covered all continents except Australia. While South American trade increased during the month, the total is still below the 1948 monthly average.

Most business transacted with an individual country was with Canada.



Walter S. Doxsey



C. Harvey Bradley

Competition Stalks the Halls of Steel

Warehousemen Discuss Latest Game—

How to Get More Customers, And Keep Them Buying

Atlantic City, N. J.

• • • There are no feet on the desk in any warehouse these days. The bossmen are buttonholing new and old customers with that savory prewar fervor. The corridors of the Ritz-Carlton Hotel here were filled with members of the American Steel Warehouse Assn. discussing the latest game—how to get more customers, how to make them buy, how to make them keep buying and how to keep the edge on small sales that big steel firms tried to gobble up when things were not so flush.

Things this week were not so flush with steel warehouses. Statements for public consumption might be hedged with ideas of a glorious future, etc., but the near-by future was what was worrying most of the steel hustlers gathered here early this week to compare stories about business conditions.

There was no longer any question of getting steel. Some warehouses had it coming out their back doors. Some of this stuff was bought by them from large steel users who got stuck with it—and sold at a loss to themselves. Very few warehousemen at the convention could say that business was looking up. Most, when talking to their good friends, admitted that April business was down somewhat from March, and May wasn't anything to write home about.

On a percentage basis overall steel warehouse business in the first quarter was down 20 to 25 pct from a year ago. But April business was down from March. Warehouse people here were smart enough to know that the downswing was an inventory reducing affair. Most of them hoped that it would not last long. None had any

idea how long the correction would last, how bad it would be or what it would do to buyers who for years have been substantial customers for the warehouses.

It is easier to get steel when it is scarce than it is to sell steel when it is plentiful, Walter S. Doxsey, president, told association members.

Warehouses and distributors got 11,336,191 tons of all kinds and varieties of steel mill products in 1948, representing 17.13 pct of total production and the greatest tonnage ever to reach consumers through secondary outlets, Mr. Doxsey said.

"We are in a competitive market now, which is to say that the prewar pattern of participation by warehouses will prevail rather than the postwar scheme. Your 1940 experiences may be a better criterion of the future than 1947-48.

"Before the war, warehouses distributed 10 pct of structurals; since the war, the percentage has

been close to 20 pct. Plates 8 pct before and 12 pct after; hot rolled bars, 8 pct and 18 pct respectively; cold finished bars, 20 pct and 30 pct, and hot rolled sheets, 9 pct and 12 pct, respectively.

"In 1940, the dollar sales of a selected number of long established warehouses were \$50 million; in 1948 these same warehouses reported sales of \$250 million. These companies did as much business in 1948 as they did in 5 years like 1940. Even when the dollar volume is adjusted to a ton basis, the ratio is better than three to one.

"Distributors will face mill competition. Producers will begin to solicit orders for the first time in many years. Buyers are already evidencing a price consciousness which will discourage them from paying warehouse prices for any items which can be bought at mill prices.

"From now on, warehouses can exist only by giving good service to buyers whose orders are too small to place with the mills and by meeting emergency demands for steel which cannot await mill delivery.

"If the predicted 20 pct decline in business activity occurs, and warehouse distribution of steel products drops to prewar percentages of total production, warehouse sales may drop to 40 or 50 pct of 1948 levels."

Conditions mitigating against these doleful prospects are, according to Mr. Doxsey:

"(1) Mills will produce and warehouses will sell more steel than they did in 1940.

"(2) Mills' production processes have been accelerated and the nuisance of handling small orders has been increased, which with higher labor costs will curtail considerably the competition with mills that warehouses faced before the war. Thus, the average size of warehouse orders should show a gain over prewar years.

Warehouse Officers

Atlantic City, N. J.

• • • Warehousemen elected Walter S. Doxsey to his ninth successive term as president. C. H. Bradley, W. J. Holliday & Co., Indianapolis, was elected chairman of the executive committee. James D. Tayler, Tayler & Spotswood Co., San Francisco, and F. W. Krebs, Super Steels, Inc., Cleveland, will serve as vice-presidents. Fred C. Flosi, A. M. Castle & Co., Chicago, was reelected treasurer.

Other members of the executive committee include: Lester Brion, Peter A. Frasse & Co., Inc., New York; Everett D. Graft, Joseph T. Ryerson & Son, Inc., Chicago; W. H. Franklin, Edgcomb Steel Co., Philadelphia; P. O. Grammer, Grammer, Dempsey & Hudson, Inc., Newark, N. J.; A. W. Herron, Jr., Jones & Laughlin Steel Corp., Pittsburgh; John L. Peebles, Peden Iron & Steel Co., Houston; George L. Stewart, Edgar T. Ward's Sons Co., Pittsburgh; and L. B. Worthington, U. S. Steel Supply Co., Chicago.

Warehouse Assn. Convention . . .

By TOM CAMPBELL
News-Markets Editor

"On the other hand, the total number of steel outlets has increased since the war from 1400 or so to more than 2000. Possibly the largest group of these postwar warehouses are made up of fly-by-night distributors of sheets and strip, many of whom are rapidly passing into oblivion.

"Markets have been curtailed by freight advances, which have compressed the distances over which a seller may absorb freight and meet competition at distant points of delivery. Unless freight rates are restored to prewar levels, small warehouses may continue to be established in the smaller outlying industrial centers, even though the Federal Trade Commission may change its stripes or Congress reverse the Supreme Court decision.

"Steel sold from these new sup-

plementary stocks will cut into the sales potentialities of the warehouses in the larger cities which formerly served these outlying markets."

The months ahead may be the most critical warehouses have ever experienced, because, in addition to the market factors mentioned previously, Mr. Doxsey said:

"Many warehouse managers, executives and salesmen have never really sold a pound of steel, have never met competition, have never said 'no' and rejected an order at a cut price."

Virtually all warehouse costs have increased.

It looks as if we have reached the point where it is illegal not to compete and it is illegal to compete too much. That was the gist



James D. Tayler

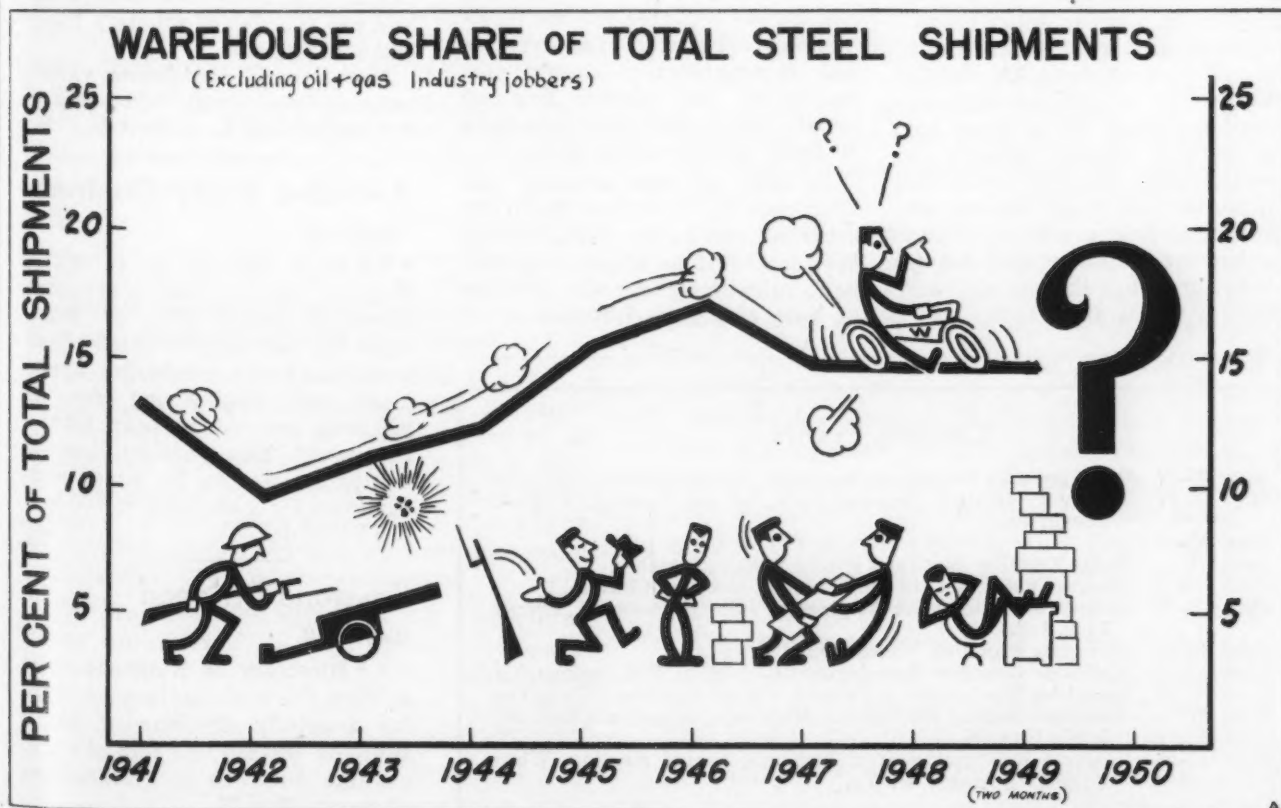


Fred C. Floss

of William Simon's message to warehouse people. He is former general counsel, Senate Trade Practice Committee.

Wending his way through the maze of Federal Trade Commission interpretations on the basing point controversy, Mr. Simon said the issue is up to Congress.

He charged that Congress has an obligation it cannot avoid. He said it has been estimated that 80 pct of the businesses in interstate commerce today are violating either the Patman Act, the Trade Commission Act or both. In this chaotic situation it is difficult to expect otherwise honest businessmen to obey the law when the



rules are so vague and meaningless.

He attacked the FTC theory that competition includes only what it calls price competition. Price competition is said to exist only when competing sellers each have different prices. Mr. Simon's point was that in such a situation one seller will have a price lower than all the others and he will get all the business.

He argued that with everyone selling at uniform f.o.b. mill prices each seller will have a local monopoly in his freight-advantage territory and there will not be any competition. He predicted that if we no longer have competition, government regulation of prices should be expected in order to protect buyers. But price regulation, he said, is ineffective without regulating production and that would be the end of free enterprise and democracy. He charged that this is precisely what the principal proponents of f.o.b. mill selling intend to accomplish.

While admitting that we were in the midst of a correction E. B. George, economist, Dun & Bradstreet, Inc., felt that in the long run the economy was not ready for a deep depression. He cited savings and consumer needs but warned that looking into the future was only a guess based on past and current statistics. He did not look for a serious drop in overall spending but pointed out that it was always difficult to forecast what human reactions will be. He said it all depends on the course prices will take and whether the consumer will decide it is better to buy than to wait for things he wants and needs.

Leo Wolman, Columbia University, covered "Labor Policy and Labor Law" for warehousemen. Other speakers included Edward L. Ryerson, board chairman, Inland Steel Co., and A. W. Herron, Jr., Jones & Laughlin Steel Corp., who led a panel discussion on f.o.b. selling and warehouse buying and selling.

Conveyor Passage Fails

Columbus, Ohio

••• The Senate Judiciary Committee has read the final rite on the Conveyor Belt Measure which would authorize construction of the 130-mile rubber railroad of Riverlake Belt Conveyor Lines, Inc. A motion to recommend the passage failed by a vote of five "no" to three "yes."

Sponsors conceded it virtually doomed any prospect this session. A similar measure was killed by indefinite postponement in the House Commerce and Transportation Committee last week.

Metal Specialist Retires

Pittsburgh

••• Dr. Arpad Nadai, consulting mechanical engineer for the Westinghouse Research Laboratories and internationally known specialist in the plastic flow of metals, has retired after more than 35 years' service in his field.

In 1937 he was awarded the Worcester Reed Warner Medal for contributions in his field. During World War II he played a prominent role in solving the problem of Navy ship plate fractures.

Appoints Members To Export-Import Group

Washington

••• Following the appointment of Benjamin Schwartz, Benjamin Schwartz Co., New York, as chairman of the export-import committee of the Institute of Scrap Iron & Steel, Inc., and Frank Gordon, Harcon Corp., Boston, as vice-chairman, the following members of the institute have been appointed to the committee:

George Sturm, David J. Joseph Co., Cincinnati; Richard Nathan, Richard Nathan Corp., New York; Robert Joseph, Commercial Steel & Chemical Corp., New York; Paul E. Herlitz, Western Steel Corp., New York; Ralph Ablon, Luria Bros. & Co., Inc., New York; Myron Chase, Luntz Iron & Steel Co., Canton, O.; Richard V. Bonomo, Schiavone-Bonomo Corp., Jersey City, N. J.; Henry T. Luria, Luria Steel & Trading Corp., New York; Bert Kaplan, M. S. Kaplan Co., Chicago; Milton Levenson, Miles Metal Corp., New York; Nathan Addlestone, Addlestone & Co., Inc., Sumter, S. C.; Chas. D. Jacobson, Houston Compressed Steel Corp., Houston; Louis Dullen, Dullen Steel Products Inc., Seattle; John Schapiro, Boston Metals Co., Baltimore; Philip Scheibner, Associated Iron & Metal Co., Oakland, Calif.

Yards Curtail Operations

Boston

••• Scrap yards, more particularly those in and adjacent to Boston, are doing something they haven't done in years. They are abandoning operations, due to the stagnant condition of business, rather than accumulate stockpiles and run the risk of taking a financial loss on same.

Duration of shutdowns varies, ranging from every other day to 3, 4 and 5 days on a stretch.

Awarded Staley Contract

Pittsburgh

••• As a part of A. E. Staley Mfg. Co.'s modernization program, Chemical Plants Div. of Blaw-Knox Co. has been awarded a contract to supply processing equipment and engineering for an 800 tons per day soybean extraction plant. Two parallel lines of equipment are to be used, each designed for a capacity of 400 tons per 24-hr day.

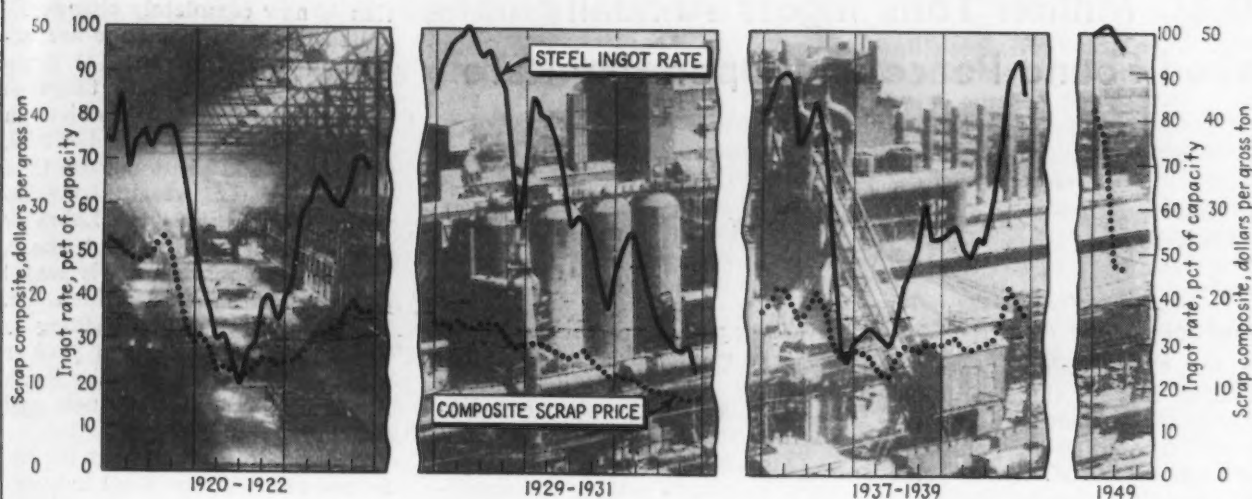
Keystone Dividend

Peoria, Ill.

••• Directors of Keystone Steel & Wire Co. have declared a regular quarterly dividend of 25¢ a share on outstanding capital stock, payable June 15 to stockholders of record May 31.

Coming Events

May 25-27	Gas Appliance Manufacturers Assn., annual meeting, Chicago.
May 25-27	Machinery Dealers National Assn., annual meeting, Virginia Beach, Va.
May 30-	
June 1	Metal Treating Institute, spring meeting, Quebec.
June 2-4	Electric Metal Makers Guild, annual meeting, Chicago.
June 5-10	Society of Automotive Engineers, summer meeting, French Lick, Ind.
June 12-16	Materials Handling Exposition, Chicago.
June 16-17	Malleable Founders Society, annual meeting, Hot Springs, Va.
June 27-30	American Electroplaters Society, annual meeting, Milwaukee.
June 27-	American Society for Testing Materials, annual meeting, Atlantic City, N. J.
July 1	
July 11-16	Concrete Reinforcing Steel Institute, annual meeting, White Sulphur Springs, W. Va.



Graph Lure—Suggests a Guessing Game

New York

• • • Everyone in the steel industry is guessing. Guessing how far down the ingot rate will go. Or whether we are in the beginning of a recession or depression. Or whether history will repeat itself.

No one knows—for sure. But there are enough straws in the wind to definitely show that steel activity is on the way down. And there is enough market information to believe that 95 to 102 pct ingot rates are at an end for sometime at least.

It may take another war or it may take a period of 2 or 3 years of "a wonderful industrial future" to engage everything that runs in steel for a sustained period.

The charts above are interesting—if nothing else. They prove nothing about the last half of 1949 and beyond. They are provocative. They are good tools for the argument which goes on all the time now wherever steel men are gathered.

Two of them are similar. The other is in a class by itself. The chart covering the early '20s depicts an inventory slump (it is always easier to call it after the figures are in and the event is past). A lot of people think we are in for that type of swing in steel. Scrap prices have been charted to show the relation between ingot rates and scrap price trends. Their relation is obvious.

The chart covering 1929-31 is only a part of one of the worst periods in steel history. That period preceded the 2 years later when a sharp upswing in the ingot rate meant going from 15 to 18 pct of capacity. Hardly anyone expects that this pattern will repeat itself in 1949-1950.

But the chart showing 1937-39 gyrations has many steel people worried. That is the pattern which quite a few think privately is now ready to be repeated. There is no advance information to support this.

If the years are forgotten the pattern in the early '20s matches the 1937-39 movement to a T. But even those who think we are in for the same dose now feel that the low points will not match those of earlier years because of population, savings, more uses, potential basic needs, etc. The reader can go on from there after remembering that what happened is fact; what will happen is guess.

The extremely sharp drop in scrap prices since early this year has some background to distinguish them from previous drops. The free scrap market, until earlier this year, was supported by gray market activity, conversion delays and premium prices in steel.

When gray market prices or conversion prices were paid for steel, they also supported high scrap prices. There is no doubt that there was a quiet gray market in scrap supported by gray market and conversion steel activity. When these types of steel prices collapsed the free scrap market was thin and it fell—fast and far.

The descent probably would not have been so sharp had there been no previous supporting factors—nor would the price have reached such a high level if consumers had not been so hog wild to get steel at any price.

60-80 Million Tons Ingots Annually Called Sound Peacetime Operating Rate

By BILL LLOYD
Cleveland Regional Editor

Cleveland

• • • A "very sound" peacetime operating rate for the steel industry would be somewhere between 60 million and 80 million ingot tons annually, C. M. White, president, Republic Steel Corp., told magazine and newspaper writers on the first leg of a press tour of Republic's northeastern Ohio steel operations.

He said the total tonnage requirements of the best year of each of the steel consuming industries in the past indicates a need for 70 million ingot tons capacity, but added, "We've got to have more steel capacity in reserve than we are using on a day-to-day basis.

"We have enough stand-by equipment in case of another national emergency. What we need are the alloying elements," Mr. White declared.

According to Mr. White, outlook for the steel industry is healthy,

although orders are not coming in as large volume as heretofore, because an inventory adjustment is taking place in the steel consuming industries.

This situation was caused, he said, by plants getting the opportunity for the first time in 10 years to buy all the steel they wanted a few months ago. As a result, large inventories were accumulated which now are being liquidated.

Replying to a question regarding the reduction in alloy-steel making operations, he said that a normal economy couldn't possibly support Republic's 1.5 million tons of alloy capacity, which is about 20 pct of the industry's total alloy capacity.

"500,000 tons of Republic's alloy capacity will do a good job in taking care of Republic's share of the alloy market," he predicted.

Asked if there would be enough iron ore to support a 70 million ton annual ingot peacetime operation,

Mr. White said the iron ore situation is now completely changed.

Reasons for the change are, according to Mr. White: (1) Beneficiation of the magnetic taconites of the Lake Superior district can now be performed, it is believed, for \$1 to \$1.50 per ton more than the cost of the present Lake Superior tonnage; (2) the Labrador ores; (3) other foreign tonnage, including Republic's newly leased deposits in Liberia, which Mr. White said would be moving to Republic plants within a year or a year and a half, and the South American ores in Venezuela and Brazil.

He said iron ore supply for the future needs of the steel industry is now only a mechanical problem.

A major factor in the movement of foreign iron ore to the Valley district, he said, will be the coal movement to the east. When the foreign ore comes in, the cars will move back to the Valley carrying ore.

He forecast a bright future for the continuous casting process, predicting that eventually about 30 pct of all carbon steel will be poured by this method. He said Republic has already invested more than \$500,000 in continuous casting research, which is being done by Babcock & Wilcox Co. and Republic Steel Corp.

Cleveland's Unemployed Increase Another 2000

Cleveland

• • • Ohio State Employment Service reported approximately 42,000 jobless workers in greater Cleveland May 1, an increase of 2000 from April and 10,000 higher than the corresponding period one year ago.

While there has been a substantial rise in unemployment during the past 4 months the current number of job seekers is considerably below prewar levels, OSES pointed out.

Census Bureau reported more than 92,600 workers unemployed in the Metropolitan area in March, 1940. Shortage occupations include the metalworking industries, which need boiler makers, ornamental iron workers, and nail machine and header machine operators. Iron and steel foundries are calling for refractory bricklayers, OSES pointed out.



INSPECTION: Main cylinder of a large hydraulically actuated press at Carnegie - Illinois Steel Corp. A 27-ton forging of 6 ft ID. The whole interior working surface was plated with industrial chromium to a thickness of 0.015 in. in Chicago plant of Chromium Corp. of America. Hard, wear resistant chromium prevents corrosion and increases packing life.

Public Funds Hold Building Volume Up As Other Types of Construction Slip

Washington

••• Increasing expenditures of public funds in the construction field is not only changing the building pattern but is bidding fair to hold 1949 dollar volume of building activity at or near last year's figure of \$18.8 billion. Governmental forecasts last December had set the figure at somewhat less.

Although off to a slow seasonal upturn in 1947, the building industry added 127,000 workers to its pay rolls in April to bring the total to 1,965,000—more than 30,000 above April 1948 employment.

As a result, dollar volume for new construction for the January-April 1949 period exceeds the \$5 billion mark as against \$4.8 billion for the same 4 months in 1948. More plentiful steel also aided in setting the new high.

Although the metal supply is still tight in respect to some building materials—such as reinforcing bars and pressure pipe—in most instances the output is above last year and unfilled order backlogs are being eaten away at a fast clip. Public works officials are now being told to keep a close eye on the situation.

While the construction rate is up, the pattern is slowly changing with public funds playing a leading role. For the first 4 months 1949, privately financed work stood at \$3.8 billion or 5 pct under last year's total; but publicly financed construction, at \$1.3 billion, had chalked up a 43 pct gain.

There has been a downward trend over past months for private industrial and commercial projects as large postwar expansion projects near completion. More money is being channeled into equipping the completed projects. This declining dollar outlay has pegged the nonresidential building total for this year at a little better than \$1 billion—about the same as last year.

Industrial construction is off 19 pct from last year and commercial building, 7 pct. But other privately financed nonresidential types, such as public utilities (up 14 pct), is holding overall levels up to those of last year.

An example of increased use of public funds in construction is the expenditure this year for educational facilities which, at \$254 million, has increased better than 80 pct over 1948. Also, three times as much—\$120 million to date—is going into hospital construction.

Other important increases to be found are highway work (up 20 pct to \$288 million), conservation and reclamation (up 41 pct to \$178 million), and sewer and water systems (up 38 pct to \$168 million).

Perhaps the most significant

change is in the housing picture. Last year, a total of about 15,000 units were built with public funds. Through April, about 13,600 had been put in place with public funds—largely state and local—as against 3700 units for the same 4 months last year.

Assuming that the same rate prevails for the remainder of 1949, the total would approach 41,000 units as against the 30,000 which public works officials estimated earlier this year.

Sparked by this increased activity in the public housing field, home building totals moved sharply upward in April with an estimated 86,000 new dwelling units put into place or started.

Uses Mobile Unit to Develop New Business

Cleveland

••• The Lake City Malleable Co. is employing a specially constructed mobile bus to display 450 items and explain their application. The company is taking advantage of this transition period to acquaint a large number of engineers, toolmakers, key men in various lines of industry, students, scientists, and metallurgists with its products.

The main purpose of the display is to develop new business through showing and explaining the applications, design possibilities, and strength characteristics of malleable iron. The exhibition will show the possibilities of malleable to the consumer and will attempt to

sell on the idea of using it for his own products.

The mobile unit will have about 450 items and 282 model castings, ranging from parts of a grave vault to a bomb nose, plus novelty items which will take chrome or silver plating. Samples of raw materials from which malleable iron castings are made will also be included in the exhibit. Several experts will be available who will explain malleable iron from start to finish.

Ohio will be the present itinerary of the coach before it increases its geographical scope. Besides industrial plants, the bus will visit schools, colleges and certain institutions.



Construction Steel . . .

• • • Fabricated steel awards this week included the following:

16,000 Tons, Philadelphia, Penrose Ave. bridge, to Bethlehem Steel Co., Bethlehem.

8800 Tons, Lake Charles, La., bridge over Calcasieu River for the Louisiana State Highway Dept. to Virginia Bridge Co., Birmingham.

2600 Tons, Pittsburgh, freight terminal and warehouse, Pennsylvania Railroad, rebid, to Ingalls Iron Works, Verona, Pa.

455 Tons, White Co., Ill. State Highway Bridge, Section F2F to Allied Structural Steel Co., Chicago.

300 Tons, Edgemoor, Del., turbo generator foundation, to Bethlehem Steel Co., Bethlehem.

285 Tons, Milwaukee building No. 84 for International Harvester Co. to Gage Structural Steel Co., Chicago.

180 Tons, Larkspur, Colo., State Highway Bridge F-0-23 to Midwest Steel & Iron Co., Denver.

• • • Fabricated steel inquiries this week included the following:

670 Tons, Loveland, Colo., U. S. Bureau of Reclamation Specification 2647, transmission towers.

410 Tons, Mendocino Co., Calif., bridge across Salmon Creek near Albion, California Div. of Highways, bids to June 15.

400 Tons, Harrisburg, Pa., admission building, Harrisburg, State Hospital, due June 21.

200 Tons, Union Co., N. J., grade crossing elimination for Lehigh Valley Railroad, New Jersey Dept. of Highways, due June 9.

200 Tons, Loveland, Colo., U. S. Bureau of Reclamation specification 2646, transmission towers.

160 Tons, Pittsfield and Williamstown, Mass., bridges over Housatonic River, Pittsfield and Green River, Williamstown. Completion date Aug. 15, 1949.

100 Tons, Danvers, Mass., reinforced concrete, bituminous macadam, and two grade separations, Newburyport Turnpike. Completion date June 30, 1951.

• • • Reinforcing bar awards this week included the following:

900 Tons, Appleton, Wis., grade school to Steiner Construction Co., Appleton, Wis.

875 Tons, Dayton, Ohio, intercepting sewer to Charles Shook Co., Dayton.

400 Tons, Chicago, Douglas airport construc-

tion through Arco Midwest Corp., Chicago, to Calumet Steel Co., Chicago Heights, Ill.

320 Tons, Madison, Wis., dairy building through J. H. Fendorf & Sons, Madison, Wis., to Ceco Steel Products Co., Chicago.

• • • Reinforcing bar inquiries this week included the following:

300 Tons, East Peoria, Ill., second dam for Farm Creek Flood Control through U. S. Engineers Office bids close June 1.

176 Tons, Danvers, Mass., reinforced concrete, bituminous macadam and two grade separations, Newburyport Turnpike. Completion date June 30, 1951.

• • • Sheet steel piling inquiries this week included the following:

185 Tons, East Peoria, Ill., second dam for Farm Creek Flood Control through U. S. Engineers Office bids close June 1.

Allis-Chalmers Reaches New Labor Agreements

Milwaukee

• • • The Allis-Chalmers Mfg. Co. recently reached new labor agreements with three unions representing approximately 750 employees. The latest agreement with the CIO United Electrical Workers' Union, No. 239, at its Hyde Park, Mass., plant provides for no immediate wage increase but

either party may reopen wage negotiations once. The new contract is similar to the old agreement in other respects.

Contracts have also been signed with the AFL International Brotherhood of Electrical Workers, local B663, and the AFL Firemen and Oilers.

A contract already has been announced with local 765 of the CIO United Electrical Workers, covering employees at the Allis-Chalmers plant in Norwood, Ohio. An interim agreement also has been announced with the CIO United Automobile Workers' union at Springfield, Ill., which recently won the bargaining rights from the CIO Farm Equipment Workers' union.

50 YEARS AGO

THE IRON AGE, May 25, 1899

• "A consular report states that the company owning the state railways in the City of Mexico are about to substitute electric power for the animal traction heretofore employed on the 300 miles of track in the district which embraces the city."

• "The Midvale Steel Co. of Philadelphia, Pa., contemplates the erection of a large open-hearth steel plant and of a large forge shop."

• "The ore unloaders at Lake Erie ports other than Cleveland have threatened to strike unless granted an additional advance of 1¢ per ton."

• "The molders are striking at a number of the Chicago foun-

dries for a 10 pct advance in wages, insisting on a minimum of \$2.75 per day for floor or bench molding."

• "There is just now a discussion among men whose opinions have, and deserve to have, the greatest weight, on the question of the future of iron ore supplies, as they affect those dependent on the Lake Superior region."

• "It is getting to be an impossibility to follow the market very closely. Buyers have to go shopping around to find what they want, and when they find it prices are a matter of private arrangement."

Purchasing Agents Elect

Chicago

• • • The Purchasing Agents Assn. of Chicago elected Arthur F. Dallia president at its annual election meeting. Mr. Dallia is purchasing agent of the Justrite Mfg. Co.

Other officers elected were Walter Armstrong, American National Bank & Trust Co., Chicago, first vice-president; Robert A. Doyle, The Glidden Co., second vice-president; Harry H. Wise, Scoville Mfg. Co., treasurer; and L. R. Seen, Borg-Warner Corp., secretary. Three members elected to the association's board of governors were Robert L. Krueger, Goodman Mfg. Co.; Dale C. Doty, Skilsaw, Inc., and Donald L. Harwood, Fairbanks, Morse & Co.

Michigan WELDED STEEL TUBING

The Modern Electric Resistance
Welded Steel Tubing

ROUND

$\frac{1}{2}$ " to 4" O. D. 9 to 22 gauge

SQUARE-RECTANGULAR

$\frac{1}{2}$ " to 2" 20 gauge—1" to 2 $\frac{3}{4}$ " 14, 16, 18 gauge

Can be BENT also . . .

FLANGED, EXPANDED,
TAPERED, DEPRESSED
BEADED, EXPAND
BEADED, ROLLED,
EXTERNAL UPSET,
INTERNAL UPSET,
SPUN CLOSED,
FORGED, BEVEL
FLANGED,
FLATTENED,
SWAGED,
FLUTED

America is the "general store"
of the world where almost any-
thing can be bought, from "a pin to
a piano." The far-sighted use by Men of
Vision in business and industry of the most
efficient and adaptable methods of manufacture
has made this possible.

MICHIGAN WELDED STEEL TUBING is used by manufac-
turers as a low-cost solution to thousands of fabrication
problems, because it simplifies design, reduces weight,
eliminates inefficient operations. Whether you wish to
form and machine the parts in your plant or order them
prefabricated by Michigan you will find this tubing excep-
tionally uniform in structure. Available in round, square
and rectangular shapes, and a wide variety of sizes.

Engineering advice and technical help in the selection of tubing best suited to your needs. Address your inquiries to:

Michigan STEEL TUBE PRODUCTS CO.

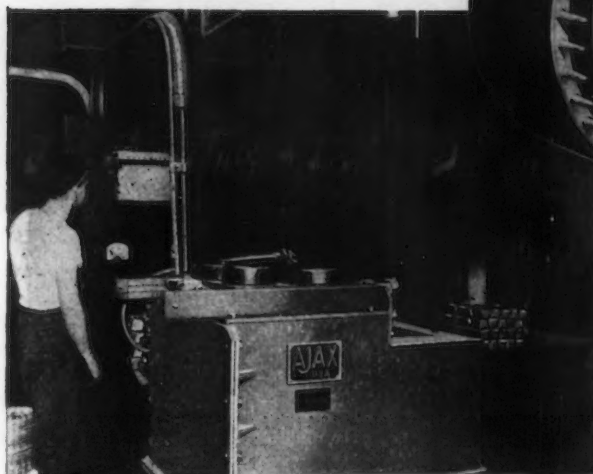
More Than 30 Years in the Business

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FACTORIES: DETROIT, MICHIGAN • SHELBY, OHIO

DISTRIBUTORS: Steel Sales Corp., Detroit, Chicago, St. Louis, Milwaukee, Indianapolis and Minneapolis—Miller Steel Co., Inc., Hilsdale, N. J.—C. L. Hyland, Dayton, Ohio—Dirks & Company, Portland, Oregon—James J. Shannon, Milton, Mass.—Service Steel Co., Los Angeles, Calif.—American Tubular & Steel Products Co., Pittsburgh, Pa.—Strong, Carlisle & Hammond Co., Cleveland, Ohio—Drummond, McCall & Co., Ltd., Toronto, Canada.

AJAX SOLVES THE PROBLEM!



Above: Thirty-inch Aluminum Rotor casting by the Reliance Electric and Engineering Company, Cleveland, at their Ashtabula, Ohio plant.

Left: Ajax 60 KW. Twin-coil Stationary Induction Furnace at Reliance.

AJAX ELECTRIC INDUCTION FURNACE HELPS INCREASE ALUMINUM ROTOR CASTING EFFICIENCY



The Ajax-Tama-Wyatt Induction Furnace at the Reliance plant plays a major part in their successful large scale production of Aluminum Rotor Castings.

The Ajax-Tama-Wyatt Electric Induction Furnace used for melting the metal preparatory to casting, is lined with a special composition to avoid contamination of high purity aluminum with silicon or iron. Temperature control of the molten metal to within one per cent or less is another advantage of this furnace.

From 30 to 40 per cent less floor

space is required for the Ajax-Tama-Wyatt Electric Induction Furnace than is required for any other. There are no fumes—shops are cooler. Operation is almost silent—working conditions are better. You'll have better labor relations, and more efficient operation through greater shop comfort when you install Ajax Induction Furnaces. Available in a wide range up to 1,000 KW., 20,000 pound capacity.

Ajax engineers have been the pioneers in Induction Furnaces for all metals since 1917. For technical details and full information contact:

AJAX ENGINEERING CORPORATION

TRENTON 7, N. J.

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INDUCTION MELTING FURNACE

Associate Companies: **AJAX METAL COMPANY**, Non-Ferrous Ingot Metals and Alloys for Foundry Use
AJAX ELECTROTHERMIC CORP., Ajax Warthrop High Frequency Induction Furnaces
AJAX ELECTRIC CO., INC., The Ajax-Hallgren Electric Salt Bath Furnace
AJAX ELECTRIC FURNACE CORP., Ajax-Wyatt Induction Furnaces for Melting

Foundry Production Off But Above Prewar Status

Los Angeles

• • • Foundrymen in this area now are convinced that the post-war leveling off place for most types of foundry business, both ferrous and nonferrous, will be above prewar production but below that of the 1944-48 peaks. There are more than 300 foundries in this area.

Foundry work for the first time in many years reverted back to the January-March "slow" period this year. Observers watching the pace since that lull are convinced that first leveling off place for most foundries will be approximately 25 pct below the peak production of a year or more ago but definitely above that of prewar status.

Although in some specific lines, foundry business has been especially slow recently. In most lines, orders for castings have picked up in the last 2 or 3 weeks to indicate that some small increases may be expected or at least the leveling off point in the softened market has been reached.

Many of the foundries now are on a 4-day week to keep a complete roll of employees and a few are for sale but, more optimistically, some returned to a 40-hr shift this month.

Iron foundries casting pipe fittings and other materials for home building suffered severe setbacks early this year when wholesalers began to sell mainly from inventoried stocks. Purchases still are in small quantities following the market and a few small foundries have cut prices. High labor costs makes this difficult.

Building has increased in the last 2 months, however, aiding some of the foundries. The Los Angeles county totals for March indicated the most brisk building since August of last year, and April was expected to be slightly higher. January had marked the low point. March permits were issued for 5855 residences and for a total construction of \$64,352,489. This is 38 pct better than January and 22.5 pct better than February.

Versatile foundries able to fill city specifications for bridge rails,



INTERNATIONAL HARVESTER

cuts cost 42%

On Refrigerator Application

When International Harvester used four Latch-Type SPEED NUTS to replace four projected weld nuts on their new refrigerator, these important benefits were gained:

1. Cost of fasteners was reduced 24% . . .
2. Portable welding equipment was transferred to other jobs . . .
3. *Total assembly savings of 42% was effected!*

Just this *one* of the many SPEED NUT applications on this product created a savings of major proportions.

In your search for ways to reduce *your* costs or improve product quality, why not investigate the Tinnerman SPEED NUT brand of fasteners? The complete line includes more than 4000 shapes and sizes.

Let us conduct a thorough Fastening Analysis of your product. Your Tinnerman representative can supply details. He's listed in major city phone directories. Or write: TINNERMAN PRODUCTS, INC., 2040 Fulton Rd., Cleveland 13, Ohio. In Canada: Dominion Fasteners Limited, Hamilton.

Red dots indicate positions of four Latch-Type SPEED NUTS used to mount the inner liner to outer sheet. Cross-section, above, shows detail of assembly. The SPEED NUT, snapped into position by hand, provides for blind attachment of top panel and produces a positive vibration-proof fastening that will not "freeze" to threads.

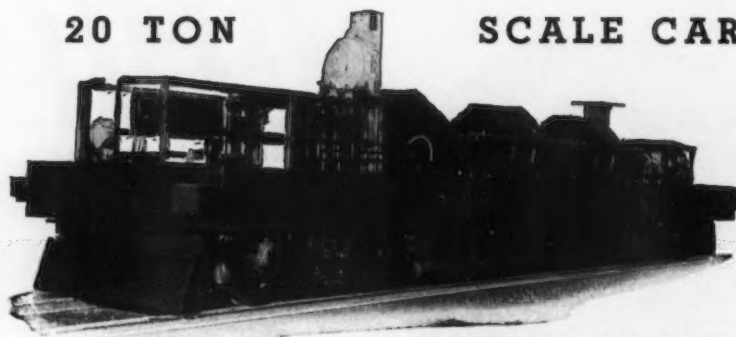
TINNERMAN *Speed Nuts*
MADE IN THE U.S.A. U.S. Patent

ATLAS

INTRA-PLANT CARS

DESIGNED AND ENGINEERED
FOR YOUR SPECIFIC NEEDS

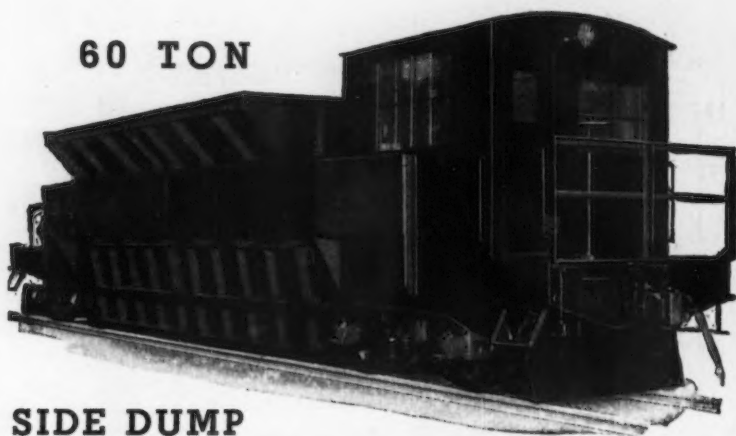
20 TON SCALE CAR



DOUBLE HOPPER
BOTTOM DUMP

Car has Atlas underslung suspension scales with Atlas 24" Scale Dial with chart recording. Air brakes and air-operated discharge gates. Cast steel side-frame trucks with Roller Bearings.

60 TON



SIDE DUMP
ORE TRANSFER CAR

900 cu. ft. capacity, two-section hopper with electric heaters. Each section has independently-operated discharge gates. Car is equipped with air brakes, automatic couplers, headlights and whistle. Each truck mounts one 75-HP motor.

Atlas Engineering Service is always at your service.



THE ATLAS CAR & MFG. CO.

NEWS OF INDUSTRY

manhole covers and similar items have picked up the most in the last few weeks and several of these have returned to a 5-day week.

O-1 tool steel castings have been off and this constitutes in most cases at least 50 pct of the business for southern California steel foundries.

Brass foundries, which increased production greatly during the war have been hard hit. One recently sold on a basis of approximately 25¢ on a dollar. Some gains in aircraft business have aided plants making aluminum castings.

Receives Honorary Degree Reading, Pa.

• • • J. Heber Parker, chairman of the board of The Carpenter Steel Co., here, will receive the honorary degree of Doctor of Science from Albright College, Reading, at commencement exercises, Sunday, June 5, 1949. The degree will be conferred by Dr. Harry V. Masters, president of the college.

A native of Reading, Mr. Parker was one of a group of 10 that constituted the first class of chemical engineering at Cornell University from where he was graduated with an A.B. degree in 1905. The same year he entered the employ of The Carpenter Steel Co. as foreman in the crucible melting department and since has taken a very active part in the development of alloy steels. In 1907 he became assistant superintendent, in 1910 metallurgist, and in 1917 vice-president. He was made president in 1941 and chairman of the board in 1948.

Hanna Declares Dividend Cleveland

• • • Directors of M. A. Hanna Co. at their annual meeting declared a dividend of 40¢ a share on common stock, payable June 11 to stockholders of record June 1. The same amount was declared at this time last year. The regular quarterly dividend of \$1.0625 on \$4.25 cumulative preferred stock was also declared payable June 1 to stockholders of record May 14.

All officers of the company were re-elected.



1 1897—America's first cars, hand-built and expensive, looked like this. Big questions of the day were—will it run? can I ever afford to buy one? Little thought was given to washing a car.



2 1915—Howell "Red Band" Motors arrived. The electrical horsepower age was already under way. Automobiles, as well as other goods and services, were soon to be better, cheaper.



3 1935—This combination brush and spray was one of many early car-washing devices. It wasn't until 1945 that modern assembly line methods began to be applied to the washing of cars.

NOW, A WASH WHILE YOU WAIT!



4 Today—Automatic car washers, like this, equipped with nine totally enclosed Howell Motors, turn out a glistening, clean car in a jiffy! Back-breaking labor is gone, valuable time is saved—all so that more people can enjoy better living at less cost.

Working in a shower of water is a tough job for electric motors. But, here again, Howell Motors have made good. These rugged, industrial type motors are an important source of power not only for car washing but also for fans, pumps, conveyors, dairy machines, and all other important industrial jobs.

Are you using Howell Motors? Try them!

Free enterprise encourages mass production, supplies more jobs—provides more goods for more people at less cost.

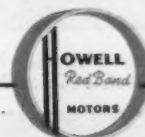
Howell totally enclosed motor built for operation in high humidity atmosphere. Remember, there's a Howell Motor for every industrial job.



Howell Enclosed or Splash-Proof Motor

HOWELL MOTORS

HOWELL ELECTRIC MOTORS CO., HOWELL, MICH.
Manufacturers of Quality Industrial Type Motors Since 1915



EC&M MAGNETS MAKE MONEY *Here's How*



FOOD FOR THE FURNACES



Magnets get the "gold in them thar hills" of slag, pull out the useable, magnetic material . . . help offset the scrap shortage . . . make profits.

BREAK-UP Aids BREAK-EVEN



"Skull cracker" (drop-ball), released from magnet, hammers the huge pieces into chargeable sizes . . . quickens melting time, lowers the "break-even" point.

UNLOADS IN 1/10 THE TIME



Magnet moves plates, bars, pipe, sheet as fast as the crane operator "contacts" the load, eliminates "hook-on" time, saves up to 90% of the time required by sling methods.

INDUSTRY'S TASK FORCE

Mobile magnet-crane reaches areas not served by overhead cranes, lift castings on and off machines, sweep floors clean of stray scrap . . . improve profits.



Since we started manufacturing magnets under the first lifting magnet patent 50 years ago, EC&M magnet users have realized huge savings in handling costs. For a "lift" in your operations, tell us size of crane, current, and material handled so that we can advise you fully.



THE ELECTRIC CONTROLLER & MFG. CO.

2698 EAST 79TH STREET

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Headquarters for Lifting Magnets, Electric Crane Controls, and Electric Motor Starters

NEWS OF INDUSTRY

Industrial Progress Up

Los Angeles

• • • Industrial growth of the Los Angeles County area since VJ day is illustrated by figures compiled by the Los Angeles Chamber of Commerce to indicate that increases have been at a rate of \$10,275,000 each month since the end of the war.

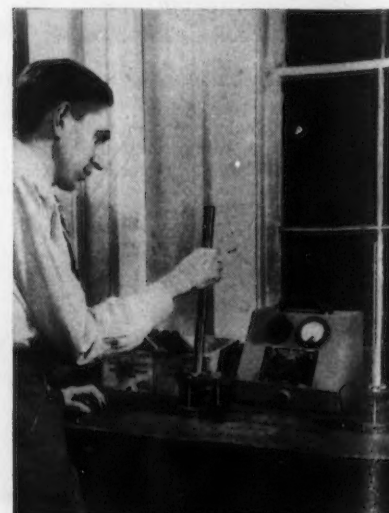
This follows great industrial growth during the war when aircraft plants were expanded and many other basic industries were opened such as the Kaiser steel plant at Fontana. It does not include the backlog of the future such as Columbia Steel's new plant and the American Brass & Copper plant to be established here.

On an overall basis, the postwar growth in industry measured \$411,133,486 for 2099 plants. This has created 78,849 new jobs directly with a payroll of \$236,547,000.

"These figures tell only part of the story," Frank N. Rush, chamber industrial committee chairman, said. "The industrial growth has increased the demand for office space, professional services, bank loans, newspapers, real estate, transportation, food, apparel, furniture and many other items."

New factories during the first quarter of this year totaled a value of \$10,210,000.

CHECKING: A GE magnetic comparator being used in the laboratory of Winchester Repeating Arms Co., New Haven, Conn. In operation, the apparatus compares parts with a preselected standard of the same size and shape to detect a difference in composition, heat treatment, or other characteristics which alter the resistivity or magnetic properties.



New TIMKEN® "Double-Zero" bearing has run-out reduced by half!

Production being increased to meet growing demand

ONE industry after another is setting new standards of accuracy by equipping precision machinery with the new Timken® "Double-Zero" bearings. Maximum run-out tolerance—standard of bearing accuracy—is only 75 millionths of an inch in the "Double-Zero" bearing—half that of the Timken "Zero" bearing which had long been the most accurate Timken bearing on the market.

This amazingly low run-out already is proving invaluable in bringing increased precision to grinding machine spindles, small precision rolling mills, lathe

spindles, dividing heads, and gear cutting machines. And production of the "Double-Zero" is being increased to meet the growing demand.

If you make a product that can benefit from greater bearing precision, you'll want to learn more about the new Timken "Double-Zero" bearing. It is produced in the sizes and types indicated in the chart below. For further information write The Timken Roller Bearing Company, Canton 6, O. Cable address: "TIMROSCO".



*This symbol on a product means
its bearings are the best.*

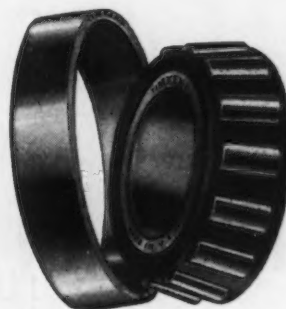
A PRECISION TIMKEN BEARING FOR EVERY REQUIREMENT

CLASS	"00" (DOUBLE-ZERO)	"0" (ZERO)	"3" (THREE)
RUN-OUT	.000075"	.000150"	.000300"
TYPES AVAILABLE	Standard Single Row	Standard Single Row	All types
SIZE RANGE	Up to 10" O.D.	Up to 12" O.D.	Up to 12" O.D.

TIMKEN

TRADE-MARK REG. U. S. PAT. OFF.

TAPERED ROLLER BEARINGS



NOT JUST A BALL ○ NOT JUST A ROLLER □ THE TIMKEN TAPERED ROLLER □ BEARING TAKES RADIAL AND THRUST ——— LOADS OR ANY COMBINATION ———

Prove for Yourself

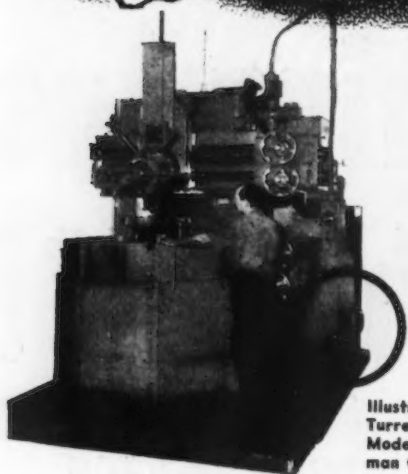


Illustration Master Vertical Turret Lathe equipped with Model TL7320 1/2 Hp Ruthman Gusher Coolant Pump.

The Superiority of **RUTHMAN GUSHER** COOLANT PUMPS

The real test of a coolant pump is how well it does its job on your metal-working machines. Here Ruthman Gusher Pumps show their outstanding superiority. You get instant Coolant flow—there is no lag between the start of the machine and the delivery of coolant.



Simple sturdy construction of Ruthman Coolant Pumps with fewer parts to wear, less vibration through precision balance, assures you of long life—minimum maintenance cost.

See for yourself the superiority of Ruthman Gusher Coolant Pumps by specifying them on your new equipment. Write for our new catalog today.

THE RUTHMAN MACHINERY CO.

1821 READING RD.

CINCINNATI, OHIO

Calls for Consumer Cooperation During Thread Changeover

New York

• • • To minimize any misunderstanding during the changeover from the 1935 screw thread standards to the new unified 2A and 2B tolerances, the sectional Committee on Standardization and Unification of Screw Threads, B1, (the body responsible for the new American Standard for Unified and American Screw Threads) of The American Society of Mechanical Engineers, has drafted the following release to industry:

The most significant modification in the Unified and American Screw Thread Standard is the addition of Classes 2A and 2B.

Class 2A is an external thread classification which provides an allowance or clearance between its maximum metal condition and the minimum metal condition of any class of internal thread into which it assembles. This clearance minimizes galling and seizing in high-cycle wrenching and high temperature applications. It also accommodates plating when required. Class 2A is recognized as standard practice for production of screws, bolts, and other threaded fasteners. Class 2B is a realistic approach to the tolerances required in the production of standard nuts.

Changing to Classes 2A and 2B does not affect strength or interchangeability. Components are mechanically and functionally interchangeable in any combinations of the old and new classes.

Specifications and adoption of these new classes of thread into actual practice will require restraint on the part of the users in order to afford manufacturers opportunity for reduction of present inventories of finished product and the working off of current stocks of tools and raw materials.

To implement changeover to the new classes of thread, users for an indeterminate period should specify the new classes but permit the old classes as optional. Conversely when specifications are not changed, users

developed for
faster blocking and
more effective penetration—



Since its introduction in 1945, Ohio Ferro-Alloys Special Blocking 50% Ferro-Silicon has established the following advantages:

- 1 Specially made to penetrate the slag and block heats faster.
- 2 Reduces material handling by 1/5 to 1/3.
- 3 Does not affect temperature of the bath.
- 4 Requires no modification of your blocking practice.
- 5 Reduces your inventory. May be used to advantage wherever 50% Ferro-Silicon is employed.

Order now for prompt delivery of any tonnage.

FERRO-SILICON 50 - 75 - 85 - 90%
H. C. FERRO-CHROME • FERRO-MANGANESE
SIMANAL • BOROSIL

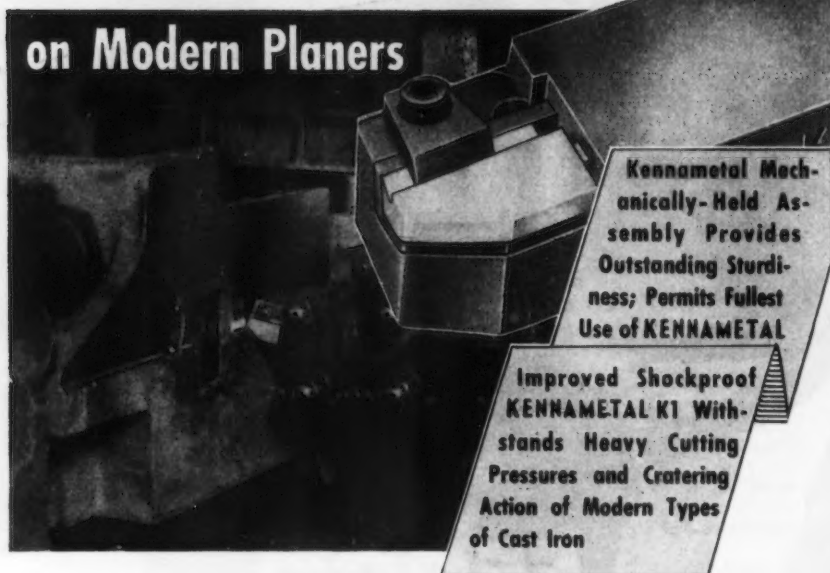
BRIQUETS
SILICON • MANGANESE • CHROME
SILICO - MANGANESE



UNIVERSITY OF MICHIGAN LIBRARIES

Remove ^{up to} 6 cu. ft. of Cast Iron ^{Per Tool Grind}

on Modern Planers



Strong, Durable, Clamped-on Kennametal Planer Tools ... Make Heavy-Duty Planing Practicable

Now you can take heavy roughing cuts at high speeds (100-250 ft/min) on any of the newer type planers having a tool lifter. Clamped-on Kennametal Planer Tools make it practicable . . . and profitable. They remove metal at a faster rate—keep machine down time to a minimum—reduce tooling cost per piece—minimize grinding time and confusion.

Yes—you need a good, rigid, properly-powered, correctly-adjusted planer. And you *must* have a strong, shock-proof, thermal-strain-free carbide tool that can take a beating and like it. Here's where the uniformly sound structure of mechanically-held Kennametal K1 pays off. Read these typical performance reports:

"Kennametal Planer Tools remove 6.5 cubic feet of semi-steel per tool grind."
"5 cubic feet of 180 Brinell cast iron removed per grind." "6 cubic feet of 180 Brinell cast iron removed per grind."

Our field engineers can help you apply this cost-cutting Kennametal tooling to your planing operations. Ask them to do it. And keep in mind—the cemented carbide that has the strength and durability to do tough roughing jobs on planers successfully is the carbide that can cut tooling costs on *all* your milling, boring machine, and lathe work. That's Kennametal.



KENNAMETAL Inc., Latrobe, Pa.

**MANUFACTURERS OF SUPERIOR CEMENTED CARBIDES
AND CUTTING TOOLS THAT INCREASE PRODUCTION**



NEWS OF INDUSTRY

should accept the new classes as optional.

Producers and users have agreed that implementation of the new standards should proceed as rapidly as transition can be effected, and that inspection should be governed accordingly. They recommend, however, that for the time being neither the new nor the old classes as they apply to screws, bolts, nuts and similar threaded fasteners, should be mandatory except for specific applications agreed upon by consumer and producer.

Calls for Mechanization

New London, Conn.

• • • Frank R. Elliott of East Springfield, a foundry superintendent, recently told the spring meeting of the American Society of Chemical Engineers that American foundries must mechanize and modernize to compete successfully with other metal working industries.

"Good management and good methods and good material handling equipment offer the only solution," he said. He added that conveyerizing the Westinghouse foundry at East Springfield has eliminated the manual lifting of 22 tons a day by each molder, and at the same time has boosted each worker's production by more than 50 pct.

"In addition," he said, "the conveyors apparently solved the problem of getting people to work in the foundry."

Apprentices Graduate

Boston

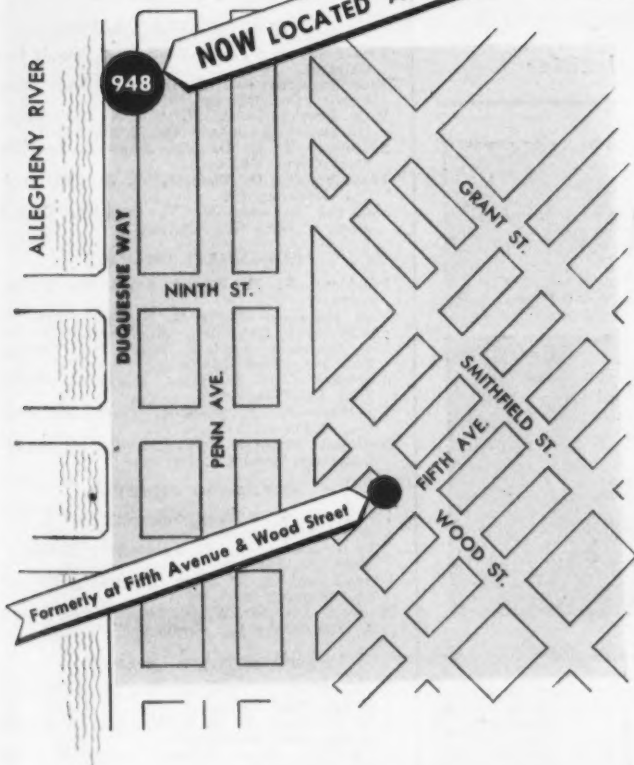
• • • The first graduation of the Boston Naval Shipyard Apprentice School since the beginning of the war was held recently with 56 members being presented with diplomas at a dinner and exercises in Hotel Continental, Cambridge. Admiral Wesley Mcl. Hague, yard commandant, presented the diplomas. Included among the graduates were riggers, machinists, boiler makers, electricians, sheet metal workers and boat builders.

We've Moved to

OUR *NEW* GENERAL OFFICE BUILDING



NOW LOCATED AT 948 DUQUESNE WAY



In this modern structure we have brought together, under one roof, many United departments formerly located in the First National Bank Building and in other downtown office buildings. You may now contact our Executive, Legal, Sales, Engineering, Research and Development, Production, Purchasing, Traffic, Treasury and Industrial Relations departments through our Main Reception Office in the lobby.

Located between Ninth and Tenth Streets, on Duquesne Way, our new home is within walking distance of Pennsylvania Station, the city's principal bus terminals and the heart of the Golden Triangle. Visitors' parking facilities are available for your convenience.

We extend you a cordial invitation to visit us, and we hope that the concentration of our administrative activities at this new location will result in the saving of valuable time for you and add measurably to your convenience.

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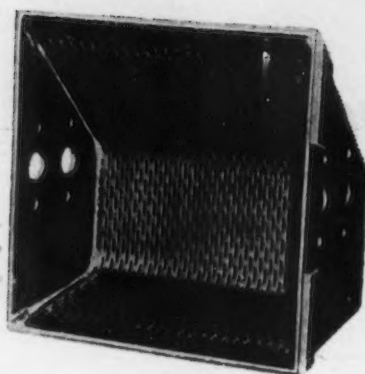
Subsidiary: Adamson United Company, Akron, Ohio

Affiliates: Davy and United Engineering Company, Ltd., Sheffield, England;
Dominion Engineering Works, Ltd., Montreal, P. Q., Canada; S. E. C. I. M., Paris, France

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Typical of Hendrick's Manufacturing Facilities



Hendrick is exceptionally well equipped to manufacture to specifications a wide range of metal products that involve such operations as perforating, shaping, forming, welding, brazing, riveting, etc. The

perforated elevator bucket illustrated is typical of the many specialized articles for whose fabrication Hendrick has unusual facilities. Write in detail regarding any metal product you desire fabricated.



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Perforated Metal Screens
Architectural Grilles
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"Shur-Site" Treads and
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The Rotor Tool Company, Cleveland, Ohio, uses a Model F Grand Rapids Hydraulic Feed Surface Grinder and a Model SS. They call their purchase of these machines an "excellent investment."



You will appreciate the micro-inch finish produced at production speeds on Grand Rapids Grinders. All Grand Rapids Hydraulic Feed Surface Grinders have these outstanding features:

1. One-piece column and base casting for vibrationless rigidity
2. Precision ball-bearing spindle which is greased for life
3. Bijur one-shot lubrication system eliminating hand oiling
4. Patented vertical movement of wheel head for quick, accurate adjustments
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6. Vane type hydraulic pump for fast longitudinal table travel

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To serve you—

Your inquiry concerning your specific grinding needs will receive prompt attention. Grand Rapids Grinders include: Hydraulic Feed Surface Grinders, Universal Cutter and Tool Grinders, Hand Feed Surface Grinders, Drill Grinders, Tap Grinders, and Combination Tap and Drill Grinders.

**GALLMEYER &
LIVINGSTON
COMPANY**

200 Straight, S. W., Grand Rapids 4, Mich.

NEWS OF INDUSTRY

New Chapter Officers Named for American Steel Warehouse Assn.

Cleveland

• • • New chapter officers for 1949-1950 have been elected by 24 chapters of American Steel Warehouse Assn., Inc., according to an announcement by Walter S. Dossy, association president.

The following officers have been elected by chapters of the association:

BALTIMORE CHAPTER

President—D. L. Ande, United States Steel Supply Co., Baltimore.
Vice President—Joseph A. Doyle, Wm. G. Wetherall, Inc., Baltimore.
Secy.-Treas.—J. D. Boan, United States Steel Supply Co., Baltimore.
National Director—George J. Parke, Eagleton-Parke, Inc., Norfolk, Va.

BUFFALO CHAPTER

President—George D. Enos, Jr., The Enos & Sanderson Co., Buffalo.
Vice President—Richard B. Kline, Burke Steel Co., Inc., Rochester.
Secy.-Treas.—John G. Stanley, Edgar T. Ward's Sons Co., Buffalo.
National Director—J. F. Rogers, Beals, McCarthy & Rogers, Inc., Buffalo.

CENTRAL STATES CHAPTER

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Vice President—D. F. Grace, Chicago Steel Service Co., Chicago.
Vice President—W. H. Tudor, Indianapolis Machinery & Supply Co., Indianapolis.
Secretary—T. B. Daniels, Jones & Laughlin Steel Corp., Chicago.
Treasurer—C. O. Bucksot, W. J. Holliday & Co., Indianapolis.
National Director—H. V. Douglas, Central Steel & Wire Co., Chicago.

CINCINNATI CHAPTER

President—R. E. Wente, SAE Steels, Cincinnati.
Vice President—Earle R. Nelson, Joseph T. Ryerson & Son, Inc., Cincinnati.
Vice President—Louis K. Wirth, Todd-Donigan Co., Inc., Louisville.
Secretary—Carl E. Bartz, Edgar T. Ward's Sons Co., Cincinnati.
Treasurer—L. R. McAfee, Peninsular Steel Co., Dayton.
National Director—John A. Thiele, Miami-Dickerson Steel Co., Dayton.

COLORADO CHAPTER

President—W. E. Geer, Midwest Steel & Iron Works Co., Denver.
Vice President—W. J. Burkhardt, Burkhardt Steel Co., Denver.
Secy.-Treas.—A. M. Hays, Hendrie & Bolthoff Co., Denver.
National Director—W. E. Geer, Midwest Steel & Iron Works Co., Denver.

CONNECTICUT CHAPTER

President—G. S. Brouso, The C. S. Mersick & Co., New Haven.
Vice President—W. V. Starkie, L. L. Ensworth & Son, Inc., Hartford.
Secy.-Treas.—J. H. Walters, Chapin & Bangs Co., Bridgeport.
National Director—G. S. Brouso, The C. S. Mersick & Co., New Haven.

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President—G. R. Link, Central Steel & Wire Co., Detroit.
Vice President—Hugh T. Smith, Smith-Winchester Co., Jackson.
Secy.-Treas.—H. W. Hartwick, Peninsular Steel Co., Detroit.
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BAIRD HIGH PRODUCTION MACHINES

• For producing articles made of wire, ribbon metal, castings, forgings or cut off bar stock.

• BAIRD 76H Chucker is an Automatic 7" Six Spindle, Indexing, Horizontal Lathe with different speeds available at the work spindles for different operations in the one handling of a piece and with other time saving features.

• BAIRD 54VC Lathe is an automatic 5" Four Spindle, Vertical Continuous Machine for many light or finishing cuts on parts, as facing ends or chamfering grooves on pistons, etc.

• BAIRD 12-Station Duplex Turning Machine is for such as turning the four trunnions on the "spider" or journals for universal joints and boring and facing the yokes of such joints.

• BAIRD Multiple Transfer Presses for multiple operation in one handling on articles made from ribbon metal.

BAIRD ALSO MAKES

• BAIRD Four Slide Wire and Ribbon Metal Forming Machines in many sizes to cover the thousands of articles made from wire and ribbon metal.

• Baird Tumbling Equipment for deburring, smoothing, cleaning, polishing, ball burnishing, heated drying, etc.

Send samples of each article you want to make in quantity.

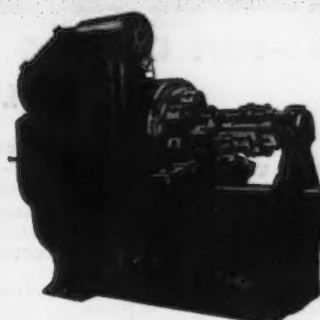
State the quantities to be made of each piece you want to make in a given time.

Give electrical current specifications AND

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BAIRD 12 STATION DUPLEX TURNING



BAIRD 76H CHUCKING MACHINE



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A 21-TON CASTING COULD BE A WHITE ELEPHANT

It takes considerable gumption to design a 20-ft. grinder bed. Many things could go wrong in casting such a monster. But the designer of this bed had confidence in our ability to cast it without distortion and structural defects—and that's what we did.

In many instances, ADVANCE CASTINGS are shipped considerable distances because our

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The character of our castings became widely known through *Strenes Metal* cast dies. We employ the same techniques in custom foundry work. If you want the evidence, write or phone us.

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STRENES METAL • ALLOY GRAY IRON • GRAY IRON

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F. E. I. offers
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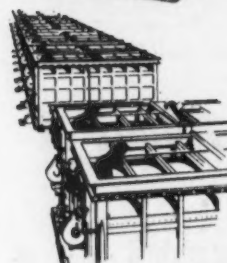
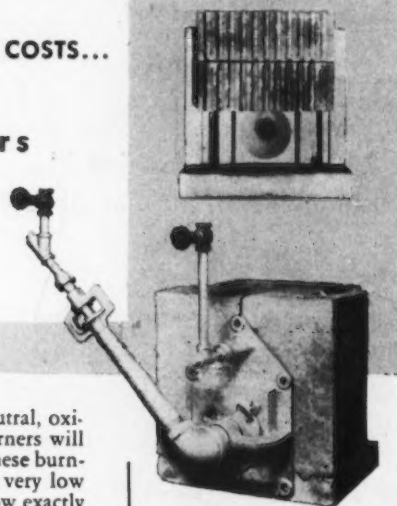
Whether your heat treating requires a neutral, oxidizing or reducing atmosphere, F.E.I. burners will reduce your costs and maintain quality. These burners possess extremely high up-turns and very low turn-downs, enabling each burner to follow exactly the demand of the controls.

F.E.I. burners furnish both high maximum input and the ability to maintain combustion at the lowest possible capacity when needed. Thus you completely eliminate the need of shutting off burners during idling periods. F.E.I. burners will meet the requirements of every stage of your heating cycle. They will operate with equal efficiency at high or low pressure. They will burn any gaseous fuel—be it butane gas, propane, natural, oil refinery, coke oven gas, blue gas, clean producer gas and clean blast furnace gas.

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It's a lightweight to lift, but when it comes to cutting ability, the portable saw shown above is definitely a "heavyweight."

Magnesium die castings made this possible! The manufacturer took full advantage of their extreme lightness and remarkable strength. This saw is powerful, sturdy, durable, yet it can be operated easily by one man. *The entire unit weighs only 49 pounds, complete!*

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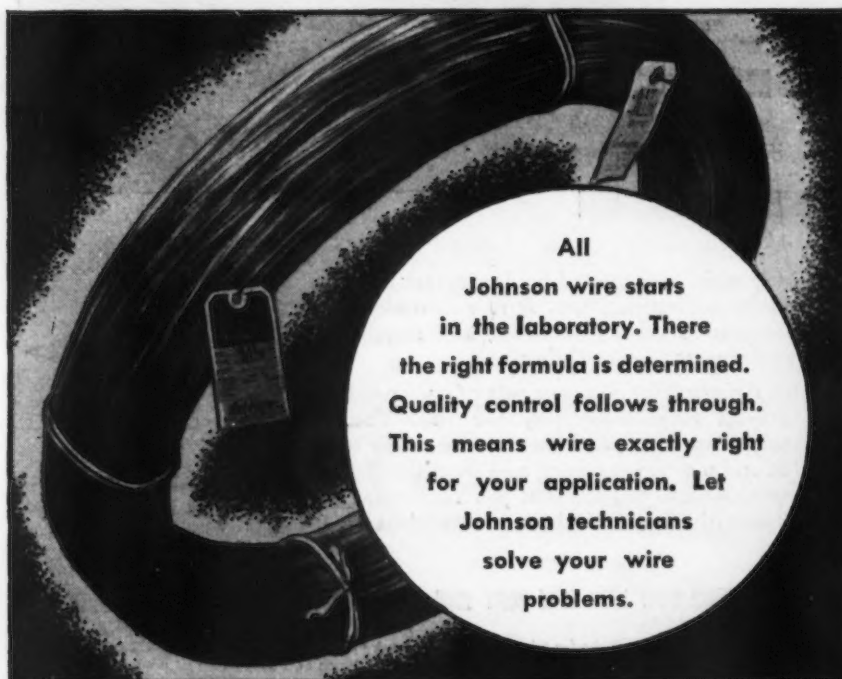
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Quality control follows through.
This means wire exactly right
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Vice President—M. S. Darbyshire, Darbyshire Steel Co., El Paso.
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Delta Toolmaker† Surface Grinder

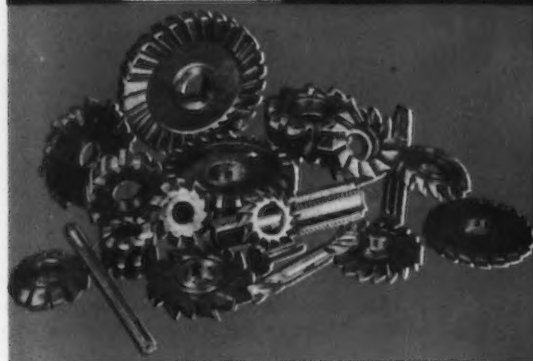
Shown at left working on a lathe bit. Has wide graduations on micrometer, for close settings. Unique wheel adapter saves time and redressing. Many other features. 7" x 1/2" wheel, 1 1/4" bore.

With simple attachments, this versatile machine becomes an efficient tool-and-cutter grinder or a chip-breaker grinder.

No. 24-105

\$375*

without wheel,
motor, or switch.



You can sharpen all these — and more —
with Delta grinders.

**These DELTA® machines
cut grinding costs
for toolroom and production work**



Delta Grinder with Twin-Lite Safety Shields — Twin-Lite Safety Shields act as "built-in goggles," flooding your work with light. Fully-machined tool rests. Balanced wheels. Lubricated-for-life ball bearings. No. 23-405 — Complete with safety shields, lamp bulbs, wheel guards, and wheels. — \$114*



Delta Carbide Tool Grinder — Combined with Delta's standard tool grinder for hogging down the shank steel, this machine gives you a perfect working combination for sharpening tungsten carbide tools. No. 23-555 — Complete with lamp attachment, water pot, and wheels. — \$154*

You would expect to pay much more for the all-around high quality you find in these low-cost Delta grinders. Delta's advanced engineering helps make industrial grinding easier, cheaper, and extremely accurate. Plant owners, superintendents, and engineers everywhere can tell you that.

Delta grinders are available in both bench and floor models—with current and speeds to suit any requirement. Simple, easily-adjusted attachments

Unthead† — A universally-adjustable work head, designed for use in connection with Delta Toolmaker Cutter Grinder. See details in catalog A-48.



Unviset — The first truly universal vise for grinding, drilling, and milling. With coolant attachment, converts Delta Toolmaker Surface Grinder to accurate Chip-Breaker Grinder. See details in Delta catalog A-48.

increase the utility of these machines. Your nearby Delta distributor has these popular grinders on display now. Inspect them there. Ask about buying on easy credit terms.

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ROCKWELL MANUFACTURING COMPANY
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M-36

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NEWS OF INDUSTRY

Finished Steel Leads Industrial Recovery In European Countries

Washington

• • • Leading industrial recovery in Western Europe, finished steel production within Marshall Plan countries will amount to 34 million metric tons for fiscal year ending June 30, 1949, the Economic Cooperation Administration estimates at the end of 12 months of operation.

Finished steel production for 1949-50 is expected to increase more than 3.5 million tons for a total of 37.7 million tons. The goal for 1952-53, when ECA will end, is aimed at 44.3 million tons (approximately 48 million short tons).

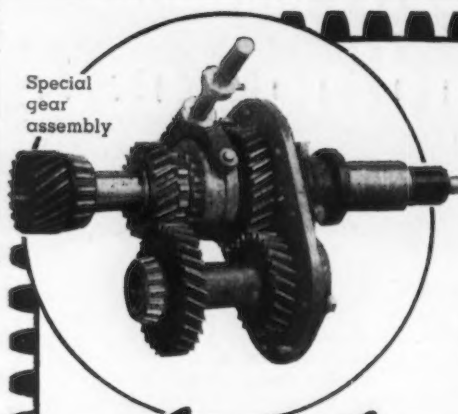
At the same time, ECA said that the steel industry within these countries plan a postwar expansion totaling more than \$3 billion. This would require importation of more than \$600 million worth of production equipment, of which two-thirds or \$400 million worth would be bought in the United States.

The ECA, however, has recommended that Western Europe stretch this program out over an 8 or 10 year period rather than try to complete it within the time limits of the Marshall Plan and thus guard against over-expansion.

From the viewpoint of the record to date, it would seem unlikely that the ambitious expansion program could be completed within the next 3 years in any event. To date, ECA authorizations for steel-making equipment total little more than \$10 million as against an estimate of \$75 million for the first 12 months. The amount expected to be authorized over the coming 12 months is estimated at perhaps \$140 million (\$110 million to be purchased from the United States).

In a brief report, the ECA said that while production of steel would continue to increase, the outlook is dim for any substantial rise in production of most non-ferrous metals until 1952-53.

Excluding western Germany, steel output of Western Europe was estimated at about 6 pct below prewar average. Next year, the combined ECA countries are expected to make a million more



Special gear assembly

*A priceless
backlog of
experience*

THE secret behind Amgears unusual service and production is the combined experience of men who have spent a lifetime in the gear business. Not only in the executive and engineering side of our organization, but all through our shop you will find men of experience operating machines who know how to give expert attention to your work. Your gear production is always in good hands at Amgears.

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For Purchasing Agents and Production Officials—Delivery date calculator free on request.

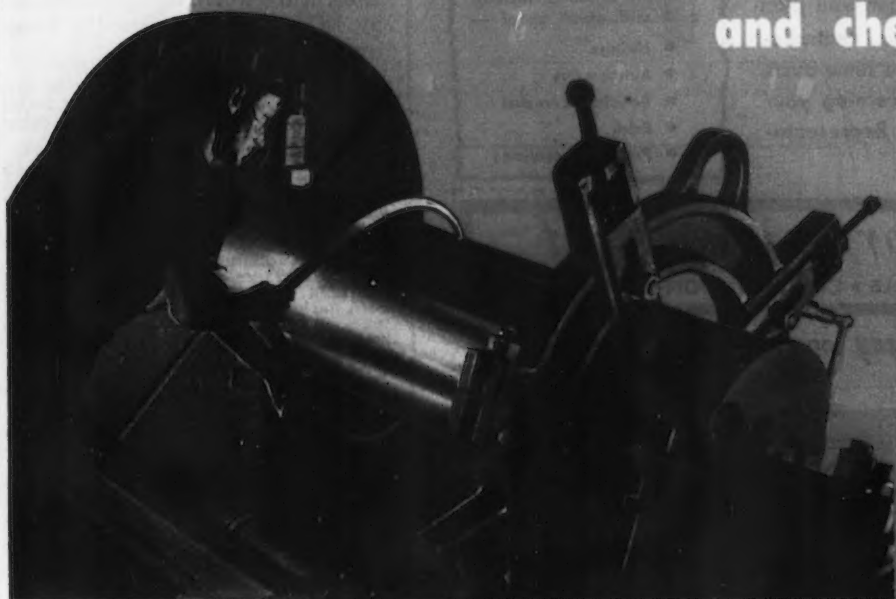
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and finishing easier
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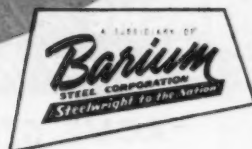
Barium lathes and boring mills will take the bigger jobs. Barium machinists take pride in their smooth, carbide-turned production.

SAVINGS you can put on the black side of your ledger and pass along to your customers . . . closer weight tolerances, for instance . . . are being realized by users of Barium rough-machined forgings. On the surface of a Barium job you can . . . with little or no further preparations . . . make hardness tests, ultra-sonic inspections, chalked or scribed layouts.

Barium's rigid quality standards require a fine finish to permit the thorough visual inspection to which all our forgings are subjected.

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ACME Polishing and Buffing Machines • **CUT COSTS!**

ACME STRAIGHTLINES

These machines are of various lengths and widths to accommodate the number of polishing and buffing heads required. Special camming fixtures, loose fixtures, "over and under", horizontal parallel return, square or triangular arrangements can be furnished, depending on part to be finished.

(Below)—44 ft. Straightline with five 15 H.P. adjustable floating head lathes—loose fixture arrangement—gravity fixture return. Each fixture carries 9-1/2" wide x 12 ft. aluminum moldings.



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Builders of AUTOMATIC POLISHING AND BUFFING MACHINES FOR OVER 35 YEARS

NEWS OF INDUSTRY

tons of crude steel than was produced prewar.

Although German production is still far below prewar, its output nearly doubled last year. Belgian output was up 35 pct, French production rose 31 pct, and England increased its output 17 pct over 1947.

As to the nonferrous groups, ECA finds the situation still "fairly tight," especially as to aluminum, copper, lead and zinc. During the past 12 months, ECA purchases of \$310 million worth of ores and metals were authorized.

A brief run-down of the current and future world situation, as seen by ECA, is as follows (in metric tons):

Aluminum. World production in 1949 slightly above 1948 levels of 1,546,000 metric tons; probable 1952-53 output about 1,900,000 tons.

Copper. Little increase in the coming year over the world production of 2,471,000 in 1948. American developments may come in during 1950-51 with a possible 1952-53 world output of 2,700,000 tons.

Lead. No increases here because of universal shortages of concentrates. Output for 1948 estimated at 1,841,000 tons. If ECA nations bring in the estimated 600,000 tons, 1952-53 potential tonnage may reach 2,150,000.

Zinc. An increase of 45,000 tons in U. S. production is forecast for 1949 with a rise in Canadian concentrates. With increased Belgian and German production, a rise from 1,728,000 tons in 1948 to 2,170,000 in 1949 is forecast.

Tin. Production has risen steadily from 126,000 tons in 1947 to 152,000 in 1948. If Malayan and Indonesian production levels are maintained, the prewar levels of 170,000 tons will be attained in 1949.

Nickel. Canada, chief producer outside of Russia, upped output last year, will produce more this year.

Cadmium. Still tight with 3400 tons produced last year. Britain, France, Austria and Italy are slowly increasing output.

Titanium. Production covering current demands. The United States planning to increase production.

Antimony. Supplies currently easy. Any substantial increases dependent upon developments in China.

Tungsten. Less critical. World production of 30,000 tons (60 pct tungsten oxide) in 1948 may rise during 1949 if Chinese, Korean and Bolivian rates are maintained.

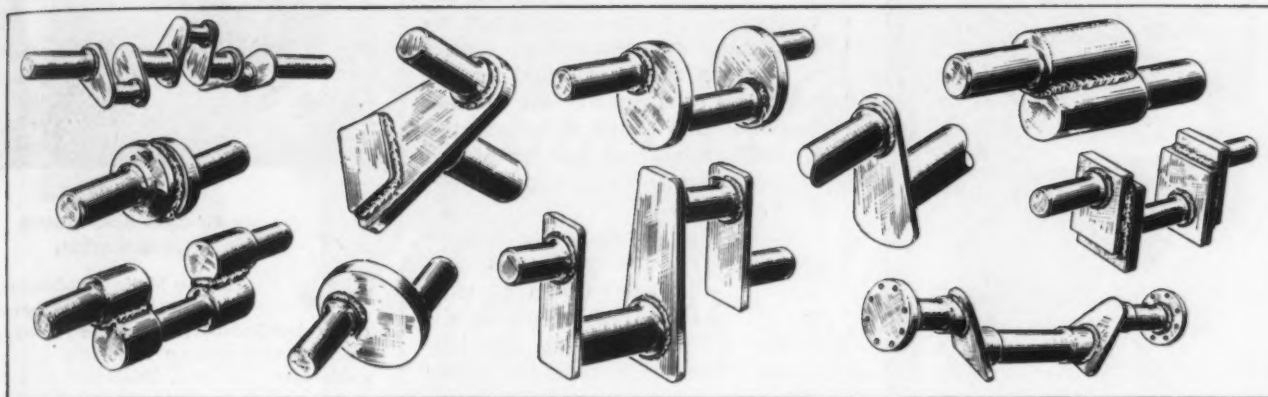
Molybdenum. Production (except Russia) was 15,000 tons in 1948, 1000 more than consumption.

First Quarter Net Down

Chicago

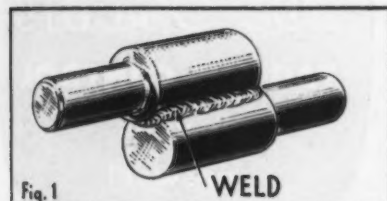
• • • Acme Steel Co. for the first quarter ending Mar. 31 showed a net profit of \$1,286,848. This is equivalent to \$1.30 a share compared with \$1.98 a share in the corresponding period of last year. C. S. Traer, chairman of the board, reported that earnings in the first quarter of 1949 contained an estimated \$370,000 of nonrecurring costs.

How Stronger Cranks Are Built at Lower Cost with Arc Welding



Examples of cranks and crankshafts fabricated from steel at lower cost with arc welding.

Many machinery parts like these simple cranks are being fabricated from standard steel shapes, eliminating the need for forgings or castings. Shaft components for the cranks may be produced from bar stock, machined to form as simple lathe operations, and throw members flame-cut from steel plate. Component parts are tack welded first or are located in simple fixtures for welded assembly using electrodes suited to the type of steel used.



Simplest of all cranks is shown in Fig. 1. Where accuracy of throw is unimportant, bars having a diameter equal to the throw can be fillet welded. If a longer crank throw must be maintained, the shafts can be fillet welded to a disc (Fig. 2) or two studs machined as shown in the lower sketch (Fig. 2) can be positioned back to back and the flanges fillet welded.

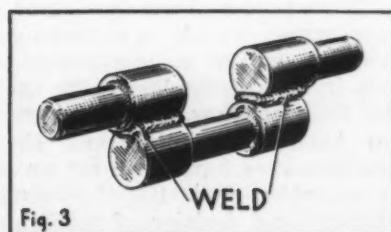
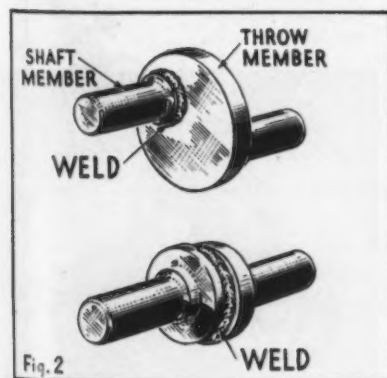
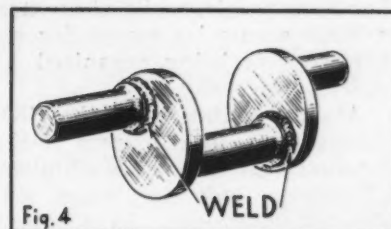
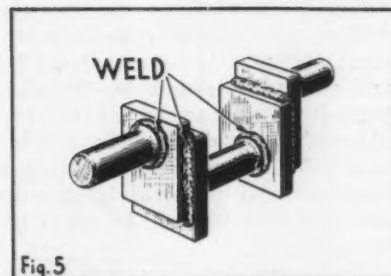


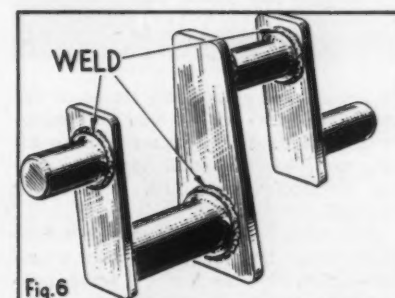
Fig. 3 shows the elements of a single-throw crankshaft. On applications where the throw of the crank exceeds the diameter of the shaft members, discs cut from bar stock or flame-cut from steel plate are incorporated (Fig. 4).



To simplify the welded assembly of a crankshaft, the throw members can be built from rectangular stock and fillet welded as shown in Fig. 5, after which a trim cut may be taken on a lathe for appearance or balance.

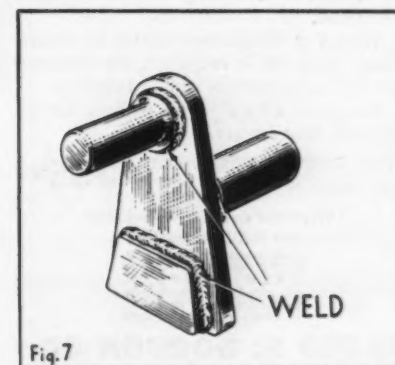


Multiple throw crankshafts, as illustrated in Fig. 6, can be weld-fabricated to suit any requirements of size and throw. If necessary, different alloys can be incorporated in various component members to best suit the needs of the crankshaft. After welded assembly, the crankshaft can be



machined all over in the conventional manner, accurately holding any size and throw specified.

Counterbalancing is easily accomplished by fillet welding weights to throw members as indicated in Fig. 7. Small deposits of weld metal can be added to any part of the crankshaft if unusually accurate balancing must be attained.



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NEWS OF INDUSTRY

SKF Industries Broaden Their Training Program

New York

• • • Voluntary management-development programs designed to encourage supervisory personnel to broaden their technical knowledge and thus qualify for greater responsibility have been started by SKF Industries, Inc., in plants at Shippensburg, Pa., and Hornell, N. Y.

Although primarily for factory supervisors, the programs are aimed at all levels of management, according to Harry F. Gracey, director of management development. They are modeled after programs which have been in effect in the company's Philadelphia plants since 1946.

Some phases of the development programs, such as technical courses, will be made available to all interested employees, he said. At Shippensburg, 26-week courses in blueprint reading and shop mathematics have been set up in cooperation with the Vocational Educational division of the Pennsylvania Department of Education.

Supervisory personnel at the same plant are enrolled at the Shippensburg State Teachers College in a course on techniques of handling people, while at Hornell a basic economics course for supervisors is being organized by Alfred University.

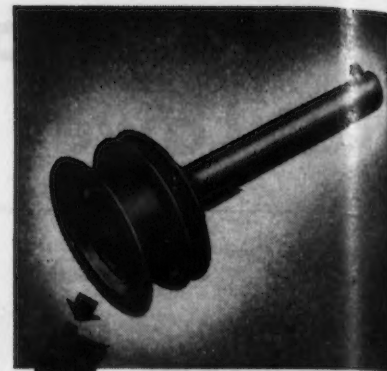
At the invitation of the SKF management, local officers of the International Assn. of Machinists, bargaining unit for wage employees at Hornell, have joined supervisors in a time-and-motion-study class.

Expands Plant Facilities

Cleveland

• • • Cleveland Cap Screw Co. will spend \$500,000 in an improvement program to be completed by mid-summer, Joseph W. Fribley, president, announced at an employees' banquet here. Mr. Fribley said \$300,000 will be invested in a chemical and physical laboratory and that \$200,000 will be spent for equipment.

The new building will cover three acres and be the third unit of Cleveland Cap's No. 2 plant. Andrew B. Wetzel will be in charge of the new laboratory.



RUD-O-MATIC MAGNET REEL-TAGLINE COMBINATION

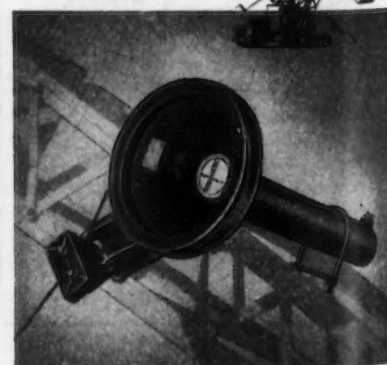
Rud-o-Matic Combination Magnet Reel-Tagline saves costly electric cable on overhead and boom crane magnet pick-up jobs. Steel tagline cable takes the load. Protective slack is maintained on electric cable. Models to fit your need.

Boom Crane or
Overhead Crane
Clam Shell Bucket
or Magnet Pick-Up

RUD-O-MATIC
TAGLINE CONTROL
is your
answer!

RUD-O-MATIC TAGLINE

holds the bucket steady at any angle of the boom. Heavy duty torsion coil spring assures constant tension at all times, at any length of cable run-out. Easily installed. Interchangeable for use on equipment of similar size. 8 models for various bucket sizes.



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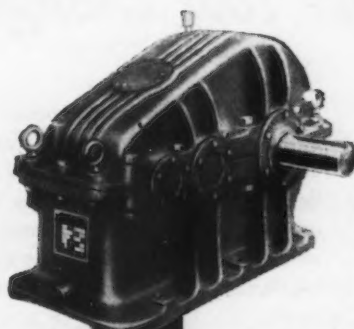
Nearly a century of engineering and manufacturing experience is back of Foote Bros. Drives. Two large plants contain the newest in gear generating equipment—new techniques in manufacture—better metallurgical control of materials—improved manufacturing methods—all assure you superior enclosed gear drives.

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Company

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Workers' Income Increased by Fringe Benefits Which Add 15 Pct. to Wage Bill

Washington

• • • The typical American worker received benefits of various sorts from his employers totalling more than \$424 over and above his wages in 1947, according to a research report completed by the Economic Research Dept. of the Chamber of Commerce of the United States.

In what was described as the first survey of its kind covering a representative cross-section of private employers of widely varying types and sizes, the Chamber found that the typical company had a "hidden payroll" of non-wage labor costs amounting to an addition of more than 15 pct to the company's reported wage bill. On another basis, these non-wage costs represented an additional payment to workers, above their

wages, amounting to an average of 20.5¢ an hr.

The Chamber's report stresses the fact that there has been no general recognition of the importance of these non-wage benefits, which include such payments as pension premiums, life insurance, old-age and survivors insurance, workmen's compensation, discounts on goods bought, tuition refunds, profit sharing, payments for time not worked, non-production bonuses, and a host of other benefits. Such payments are not included in wage figures as reported by employers, labor organizations, or government agencies.

The largest single item on the list of non-wage benefits was payments for time not worked, and not included in wage figures. These payments were equivalent

to an addition of almost 5 pct to the wage bill. They included paid vacations, bonuses in lieu of vacations, payments for holidays not worked, supplemental pay for National Guard duty, and the like.

Another major category, equivalent to an addition of 4.5 pct to the wage cost of the average company, consisted of the employer's share of pension and other agreed-upon payments.

Legally required payments (such as old age insurance, unemployment insurance, workmen's compensation, etc.) were equivalent to 3.2 pct of the wage bill. Other miscellaneous payments brought the total of non-wage benefits to a 15.4 pct addition to the reported wage costs of the average company.

The survey was made in three parts: a nationwide cross-section of industry, a complete report on all Class I railways, and a study of the St. Louis industrial area, which permitted a more intensive analysis of smaller firms.

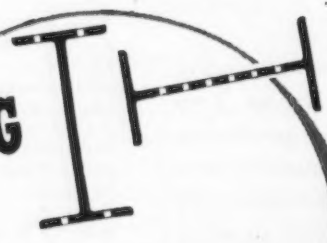
The reports studied by the Chamber indicated a wide variation in payments among firms and industries. In general, smaller companies had smaller proportionate non-wage payments. The payments increased with size of firm until firms of 1000 employees were reached, after which the payments levelled off at between 15 and 16 pct of the wage bill.

Highest non-wage payments were reported by banks and financial institutions where they averaged 23.4 pct above the wage cost; and public utilities, with an average of 20.5 pct.

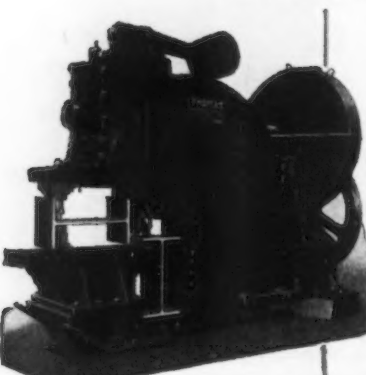
For individual firms, non-wage payments represented an addition to the wage bill ranging up to 42 pct.

While the Chamber's survey, made late in 1948 and early in 1949, was necessarily confined to 1947 data, all evidence since then points to the fact that non-wage costs have risen substantially, since union demands emphasize so-called fringe and similar benefits as supplements to wage income.

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These are the immediate results achieved by one of the major automotive plants using Magnaglo* for inspection of connecting rod forgings. Here's the complete story:

FORMERLY— Connecting rod forgings were cleaned by pickling, then visually inspected. Cost per thousand was \$7.50 for cleaning and inspection.

TODAY— Forgings are cleaned by shot blasting, then inspected with Magnaglo under black light, using less man hours with semi-automatic Magnaflux production units. Cost is now \$6 per thousand.

Faster inspection at lower cost . . . yes; and still more important is the far greater accuracy of Magnaglo. With visual inspection this plant saved \$100 per day in machining time by eliminating defective forgings in the rough state. With Magnaglo, savings are \$200 per day because twice as many defective forgings are spotted *before* machining.

Production officials of this plant give full approval to Magnaflux for improved quality control at production line speed that really "pays off". Magnaflux non-destructive inspection can achieve similar savings for you—write today for full particulars.

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NEWS OF INDUSTRY

March Work Stoppages Increase; Less Than '48

Washington

• • • Work stoppages increased to 275 in March as compared to 225 in February with 500,000 workers involved in March against 80,000 in February, the Bureau of Labor Statistics reports.

About 3.6 million man-days were lost in March as compared to 650,000 in February—largely as a result of the bituminous protest strike which took out nearly 400,000 workers from Mar. 14 to 25.

First quarter totals were 725 strikes, 650,000 workers, and 5,000,000 man-days lost; comparative totals for last year are 748 strikes, 665,000 strikers involved, and 8,400,000 days lost.

Will Resume Production

Salt Lake City

• • • Rheem Mfg. Co. will resume the production of coal burning furnaces and stokers in Salt Lake during May, company officials announced. The firm formerly operated here but discontinued manufacturing in January, 1947.

The new \$250,000 plant is located in Industrial Center, the wartime Small Arms Ammunition plant which was purchased for development and leasing to various industries by a group of local investors.

Initially part of the Chicago operations will be moved to the new plant here. Ultimately the entire Chicago manufacturing business will be transferred to this location, according to company officials. Gas and oil furnaces will be added to the line later if demand justifies the expansion.

Doubles Net Profit

Cleveland

• • • Cleveland Graphite Bronze Co. reported net sales of \$8,958,733 and net profit of \$1,052,180 for the first quarter, 1949. In the corresponding period last year sales were \$6,657,354 and profit was \$522,437.

The profit in the latest quarter was lower than the \$1,386,886 reported for the fourth quarter of 1948, which included substantial additions to profit on account of year-end inventory adjustments.

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USE Oakite Pickle Control No. 3 to inhibit hot sulphuric-acid pickling baths! Use Oakite Pickle Control No. 4 to inhibit hydrochloric-acid pickling baths!

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3. Reduced tendency toward hydrogen embrittlement — greater protection against blistering of electroplated parts.
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T-P Cylindrical Plug Gage of hardened alloy steel

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*Norbide (Boron Carbide), Trademark of Norton Co., Reg. U. S. Pat. Off.

T-P Style 9324 AGD Flange-type External Ring Gage of hardened alloy steel

T-P External Ring Gage with insert gaging surface of tungsten carbide

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You'll find that more pieces can be gaged per gage dollar when you standardize on Taft-Peirce Cylindrical Plug and Ring Gages. Not only are they made of the finest materials, heat-treated for maximum hardness, but they are ground and lapped to gagemakers' limits of accuracy by a special process which produces a super-smooth surface, assuring long wear-life and dependable precision.

The exceptionally complete Taft-Peirce Gage line includes Emmerton Ball Bearing Plug Gages, special gages to your specifications, and of course all American Gage Design standards. Available in alloy steel, Norbide,* Tungsten Carbide and Chromium plated. Write to:



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T-P MEANS TOP PRECISION

MACHINE TOOLS

... News and Market Activities

April Orders For Machine Tool Industry Drop to 6-Month Low

... Machine tool builders' March feast became an April famine, as April order volume dropped from a March peak to the lowest point since October 1948.

According to the preliminary index of machine tool orders and shipments compiled by the National Machine Tool Builders' Assn., which was released this week, April was 69.8 compared with 93.5 for March, high point for the industry since July 1947. The October 1948 order index was 67.4, low point of last year.

NMTBA's index of April shipments was 74.4 compared with March's 75.8.

Of new firm orders reported, foreign order index was 21.6 for April compared with 22 for March. Cancellations are estimated at about 6 to 7 pct.

Ratio of unfilled orders to shipments, as reported to NMTBA, was 4.4 to 1, unchanged from March.

A major factor in the April order slump, according to industry sources, is the number of strikes either actively under way or in the wind. Another factor is the liquidation of inventory now under way in many of the steel consuming industries. Both create a climate of business uncertainty which is anathema to the sale of capital equipment.

On the other hand, some observers foresee that 1949 will be as good as 1948, with shipments of \$285 million. This prediction is based on three factors: (1) That the industry has at present \$75 million in ECA business scheduled from July 1, 1949 to July 1, 1950; (2) a rather substantial volume of aircraft business, stemming from the defense program, may produce more than \$50 million in machine tool orders, with placement getting under way within 6 weeks or 2 months; (3) by fall, some recovery in general business can be expected.

Present Order Slump Due To Strike Uncertainty and Inventory Liquidation

o o o

Other observers, basing their prediction on first quarter machine tool shipments, see 1949 as a \$250 million year for the industry.

In Cleveland, E. W. Bliss Co. announced last week that it will abandon its plant here when present contracts are completed. The plant, which Bliss has maintained here for 28 years, has been sold to Lincoln Electric Co. as part of its future plant site.

Louis C. Edgar, Jr., Bliss president said the Cleveland plant has always operated as a surplus unit and it has been decided to handle this production in the future at the plants in Salem and Toledo. The company last year disposed of its Brooklyn plant. Bliss has a plant at Hastings, Mich., and operates factories at Derby, England, and St. Owen, Seine, France. Headquarters are at Toledo.

Mr. Edgar said the present slackening trend of business caused officials to decide to give up the Cleveland plant. Mr. Bliss, who succeeded Mr. Marshall M. Smith as president last February, was formerly president of H & B American Machine Co., textile machinery manufacturer.

In Philadelphia, sources in the trade report that orders are slow in arriving, but the volume of inquiries continues high. Some government orders are being placed, which is usually the case toward the end of the fiscal year. According to reports, some Naval steel contracts have been placed here recently.

In New York, Landis Machine Co., Waynesboro, Pa., reported net profit of \$2,000,318 for the year ended Dec. 31, 1948. Net is

equal to \$6.32 a common share, compared with net of \$1,538,189 or \$4.87 a share in the preceding year.

In Detroit a long awaited break in new tooling for an automatic transmission has occurred. As predicted in THE IRON AGE several months ago, new tooling orders have been placed by Detroit Gear Div. of Borg-Warner Corp. for a new automatic shifting unit of the torque converter type for Studebaker Corp. It has been learned that nearly a third of the contracts for the new equipment have already been placed.

Deliveries of new equipment will probably start at the end of the year. Studebaker officials have declined to predict when production of the new transmission units will be started.

There is also renewed activity here on a new engine for Chrysler-Dodge Div. According to trade sources, revised quotations have been requested this week on a Chrysler-Dodge tooling program. Some sources are hopeful that final decision on the new engine program will be made on the basis of these quotations.

It is not expected that a great deal of buying will be occasioned by the recent GM announcement that work will begin June 15 on its new Technical Research Center on Mound Road. Much of the equipment for this project has already been purchased, according to local machine tool suppliers.

In New England virtually all machine tool builders are operating with fewer employees than on Jan. 1, due to dwindling orders. To date, however, layoffs have not been drastic. They may appear fairly so in June and July because in those months a few manufacturers plan to close for vacations.

With metalworking industries curtailing new construction and plant improvements, the tendency is to make those machine tools on hand do for the time, at least.

Small Lot Production.. *no problem at*

AMERICAN LOCOMOTIVE

THEY know how to produce parts in short runs, profitably, at American Locomotive. They use Warner & Swasey Turret Lathes set up with Standard Tooling.

These five pictures taken at the Diesel Engine Division in Auburn, N. Y., show five different jobs being machined on five different model Warner & Swaseys. The largest lot is only 500 pieces and the smallest is just six.

In fact, Warner & Swasey Turret Lathes with Standard Tooling Setups are so flexible, American Locomotive regularly uses them for single piece jobs.

Jobs can be switched quickly with little downtime. Warner & Swasey power handles heavy multiple cuts. Warner & Swasey speed permits fullest advantages of carbide tools. Rigid Warner & Swasey design guarantees accuracy.

These turret lathes turn everything from grey iron castings to tough alloy steels and hold .0005" regularly.

That's how Warner & Swasey Turret Lathes help American Locomotive solve the small lot problem. Why not see how they can help you? Call the nearest Warner & Swasey representative or write

*You can machine it Better,
Faster, for Less... with a
Warner & Swasey*

**WARNER
&
SWASEY**
Machine Tools
Cleveland



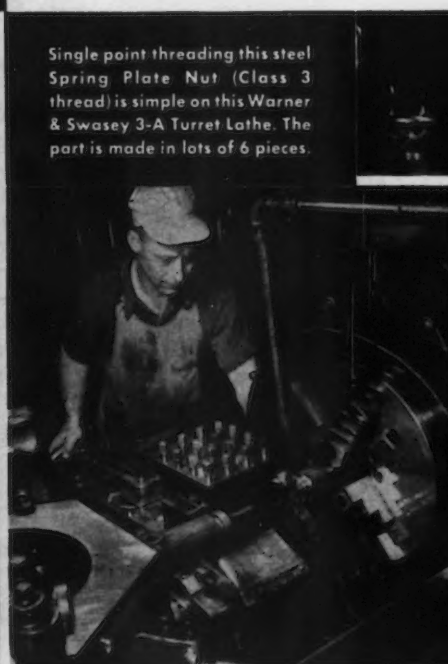
Limits of .0005" on the I.D. and .001" on the O.D. are easily held on this Starting Valve Cage of cast iron. This lot of parts has 13 pieces. The Warner & Swasey 4-A Turret Lathe shown is used for producing single repair parts also.



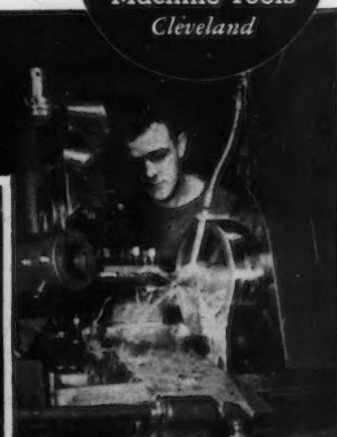
Diesel Engine Division of American Locomotive uses this Warner & Swasey No. 5 Universal Turret Lathe to machine Push Rod Ends in lots of 500. Closest limit held on this job: .0005".



On this Warner & Swasey No. 3 Universal Turret Lathe, a hot rolled SAE 1020 Trip Latch Pin is being machined in lots of 25 pieces. Small repair work is also done on this No. 3.



Single point threading this steel Spring Plate Nut (Class 3 thread) is simple on this Warner & Swasey 3-A Turret Lathe. The part is made in lots of 6 pieces.



A steel forged drive gear for Diesel locomotives being machined on a Warner & Swasey 1-A Turret Lathe. Limit: .0005" on O.D. of hub. Pieces in lot: 20. Repair parts for locomotives are also made on this machine.

TURRET LATHES, MULTIPLE AND SINGLE SPINDLE AUTOMATICS, PRECISION TAPPING AND THREADING MACHINES

NONFERROUS METALS

... News and Market Activities

Lead, Zinc Cut 1¢; Other Metals Hold Former Prices Weakly

New York

• • • On Monday a leading custom smelter reduced the price of lead by 1¢ per lb, bringing the price to 13.00¢ New York. This marks the seventh reduction in the price of lead since Mar. 8 for a total drop of 8.5¢ per lb. St. Joseph Lead Co., while selling on some contracts on an average price basis, had so far taken no action to meet the previous reduction of 1¢ made on May 6.

The latest reduction reflects the apathy in the metal markets that set in after the small flurry of buying last week when the copper market was strengthened by the possibility of another strike at the Utah mine. There was also some buying of lead and zinc at that time, at least in carload lots. The export copper market developed some business at 1/4¢ above the previous market, but this premium business has since dried up.

The custom smelter that was in the copper scrap market last week at 15.00¢ for No. 1, 13.50¢ for No. 2 and 12.50¢ for light copper has withdrawn from the market and the scrap market has declined by 1 1/2¢ for No. 1 and 1¢ for the other two grades. Information in the trade indicated that buying at the higher prices was only on a token basis. The weakening in the scrap market prompted a Philadelphia ingot producer to reduce brass and bronze ingots by 1 1/4¢ per lb. Readjustment in aluminum ingot prices also reduced several grades by 1/2¢ per lb.

All metal markets were inactive in the latter part of last week, and there was no change early this week. The reduction in the lead market will no doubt create an impression among consumers that further reductions may also be expected in copper and zinc. So far there has been no indication that repeated price reductions have stimulated any business.

There are a few straws in the wind that may indicate a better outlook for metal producers. One brass mill reports there has been a slight improvement in its order vol-

Copper Scrap Sags Badly On Heels of Price Strength Shown Previous Week

• • •

ume since its prices were dropped to the 18.00¢ copper level. The improvement was not important, but it indicates that some consumers have felt that 18.00¢ was about right for copper. There has been a relatively heavy influx of warehouse orders from consumers who need metal but do not want to order in mill quantities.

It is reported that there has been some tightening in the aluminum and magnesium scrap markets. On the other hand, buying prices for Monel scrap are down as the result of the general inactivity of the secondary markets.

There has been no change in the deadlocked negotiations between Kennecott Copper Corp. and the union.

The first move to demand the reinstatement of the copper tariff when its suspension expires at the end of June next year was taken by Miami Copper Co. E. H. Westlake, vice president, announced at the company's annual meeting that the management plans to ask Congress to restore the tariff. This would necessarily be for only half the original 4¢ per lb rate, as the Geneva Conference agreement cut the rate for a period of three years.

Further confirmation of the in-

activity in the lead market was found in the April shipments figures for replacement batteries as reported by Dun and Bradstreet. April shipments were 496,000 units, down by 64,000 units from March which was also a long time low point. By comparison, shipments of April a year ago were 1,211,000. Shipments of replacement batteries reached a high point in October of 2,845,000.

Chinese antimony is being offered in this country at 38.50¢ New York, the same price as that of the domestic producer at Laredo, Tex. Like other nonferrous markets, the antimony market is very dull.

Meanwhile there is a growing belief on the part of nonferrous producers that price cuts do not induce consumers to enter the market and buy substantial tonnages. They have become convinced, on the basis of experience in recent weeks, that price cuts only cause consumers to stay out of the market and wait for further reductions, which they become convinced are sure to come.

At the same time it is a well-known fact that consumers generally have been engaging in an ultra-cautious type of buying. In addition to the above there are two common reasons for this: (1) Consumers have been paring inventory to the bone because they have felt the price trend to be down and did not want to get caught with high inventories. (2) Consumers have been buying in unusually small quantities, placing orders for tonnage only as orders are received by them.

Nonferrous Metals Prices

	May 18	May 19	May 20	May 21	May 23	May 24
Copper, electro, Conn.	18.00-18.50	18.00-18.50	18.00-18.50	18.00-18.50	18.00-18.50	18.00-18.50
Copper, Lake, Conn.	18.625	18.625	18.625	18.625	18.625	18.625
Tin, Grade A, New York	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03	\$1.03
Zinc, East St. Louis	12.00	12.00	12.00	12.00	12.00	11.00
Lead, St. Louis	13.85	13.85	13.85	13.85	12.85	12.85

Note: Quotations are going prices.

Primary Metals

(Cents per lb, unless otherwise noted)

Aluminum, 99+%, 10,000 lb, freight allowed	17.00
Aluminum pig	16.00
Antimony, American, Laredo, Tex.	38.50
Beryllium copper, 3.75-4.25% Be	
dollars per lb contained Be	\$24.50
Beryllium aluminum 5% Be, dollars per lb contained Be	\$52.00
Bismuth, ton lots	\$2.00
Cadmium, delf	\$2.00
Cobalt, 97-99% (per lb)	\$1.80 to \$1.87
Copper, electro, Conn. Valley	18.00 to 20.00
Copper, lake, Conn. Valley	18.625
Gold, U. S. Treas., dollars per oz.	\$35.00
Indium, 99.8%, dollars per troy oz.	\$2.25
Iridium, dollars per troy oz.	\$100 to \$110
Lead, St. Louis	12.85 to 14.80
Lead, New York	13.00 to 15.00
Magnesium, 99.8+%, f.o.b. Freeport, Tex.	20.50
Magnesium, sticks, carlots	34.50
Mercury, dollars per 76-lb flask, f.o.b. New York	\$82 to \$84
Nickel, electro, f.o.b. New York	42.93
Palladium, dollars per troy oz.	\$24.00
Platinum, dollars per troy oz.	\$72 to \$75
Silver, New York, cents per oz.	71.50
Tin, Grade A, New York	\$1.03
Zinc, East St. Louis	11.00
Zinc, New York	11.70
Zirconium copper, 10-12 pct Zr, per lb contained Zr	\$12.00

Remelted Metals

Brass Ingot

(Published prices, cents per lb delivered, carloads)

85-5-5-5 Ingot	
No. 115	14.25*
No. 120	13.75*
No. 123	13.25*
80-10-10 Ingot	
No. 305	21.75
No. 315	18.75
88-10-2 Ingot	
No. 210	28.50
No. 215	25.50
No. 245	17.00*
Yellow Ingot	
No. 405	11.75*
Manganese bronze	14.50
No. 421	19.50
* F.o.b. Philadelphia.	

Aluminum Ingot

(Cents per lb, lots of 30,000 lb)

95-5 aluminum-silicon alloys	
0.30 copper, max.	19.50-20.00
0.60 copper, max.	19.00-19.50
Piston alloys (No. 122 type)	16.50-17.00
No. 12 alum. (No. 2 grade)	15.50-16.00
108 alloy	16.00-16.50
195 alloy	17.50-18.00
13 alloy	19.00-19.50
AXS-679	16.50-17.00

Steel deoxidizing aluminum, notch-bar

granulated or shot

Grade 1—95 pct-95 1/2 pct	16.25-16.50
Grade 2—92 pct-95 pct	15.25-15.50
Grade 3—90 pct-92 pct	14.25-14.50
Grade 4—85 pct-90 pct	13.50-14.00

Electroplating Supplies

Anodes

(Cents per lb, freight allowed, in 500 lb lots)

Copper	
Cast, oval, 15 in. or longer	34%
Electrodeposited	28%
Rolled, oval, straight, delivered	31.84
Ball anodes	32%
Brass, 80-20	
Cast, oval, 15 in. or longer	30%
Zinc, oval, 99.886, f.o.b. Detroit	22 1/2
Ball anodes	20 1/2
Nickel 99 pct plus	
Cast	59.00
Rolled, depolarized	60.00
Cadmium	\$2.15
Silver 999 fine, rolled, 100 oz. lots, per troy oz, f.o.b. Bridgeport, Conn.	79

Chemicals

(Cents per lb, f.o.b. shipping point)

Copper cyanide, 100 lb drum	48.00
Copper sulfate, 99.5 crystals, bbls.	9.10
Nickel salts, single or double, 4-100 lb bags, frt. allowed	18.00
Nickel chloride, 300 lb bbl.	24.50
Silver cyanide, 100 oz. lots, per oz.	59
Sodium cyanide, 98 pct domestic 200 lb drums	19.25
Zinc sulfate, crystals, 22.5 pct, bags	6.75
Zinc sulfate, 25 pct, flakes, bbls.	7.75

Mill Products

Aluminum

(Base prices, cents per pound, base 30,000 lb, f.o.b. shipping point, freight allowed)

Flat Sheet: 0.188 in., 2S, 3S, 26.9¢; 4S, 61S-O, 28.8¢; 52S, 30.9¢; 24S-O, 24S-OAL, 29.8¢; 75S-O, 75S-OAL, 36.3¢; 0.081 in., 2S, 3S, 27.9¢; 4S, 61S-O, 30.2¢; 52S, 32.3¢; 24S-O, 24S-OAL, 30.9¢; 75S-O, 75S-OAL, 38¢; 0.032 in., 2S, 3S, 29.5¢; 4S, 61S-O, 32.5¢; 52S, 36.2¢; 24S-O, 24S-OAL, 37.9¢; 75S-O, 75S-OAL, 47.6¢.

Plate: 1/4 in. and heavier: 2S, 3S, F, 23.8¢; 4S-F, 26¢; 52S-F, 27.1¢; 61S-O, 26.6¢; 24S-F, 24S-FAL, 27.1¢; 75S-F, 75S-FAL, 33.9¢.

Extruded Solid Shapes: Shape factors 1 to 4, 35.1¢ to 66¢; 11 to 13, 36.1¢ to 78¢; 23 to 25, 38.2¢ to \$1.07; 35 to 37, 45.7¢ to \$1.65; 47 to 49, 67.5¢ to \$2.41.

Rod, Rolled: 1.064 to 4.5 in., 2S-F, 3S-F, 34¢ to 30.5¢; Cold-finished, 0.375 to 3.5 in., 2S, 3S, 36.5¢ to 32¢.

Screw Machine Stock: Drawn, 1/4 to 1 1/2 in., 11S-T3, R317-T4, 49¢ to 33¢; cold-finished, 1/4 to 1 1/2 in., 11S-T3, 37.5¢ to 35.5¢; 1/2 to 2 in., R317-T4, 37.5¢ to 34.5¢; rolled 1 1/2 to 3 in., 11S-T3, 35.5¢ to 32.5¢; 2 1/4 to 3 1/2 in., R317-T4, 33.5¢ to 32.5¢. Base 5000 lb.

Drawn Wire: Coiled, 0.051 to 0.374 in.: 2S, 36¢ to 25.5¢; 52S, 44¢ to 32¢; 61S, 47¢ to 38.5¢; 17S-T4, 50¢ to 34.5¢; 61S-T4, 44.5¢ to 34¢; 75S-T6, 76¢ to 55¢.

Magnesium

(Cents per lb, f.o.b. mill, freight allowed Base quantity 30,000 lb)

Sheet and Plate: Ma, FSA, 1/4 in., 54¢-56¢; 0.188 in., 56¢-58¢; B & S gage 8, 58¢-60¢; 10, 59¢-61¢; 12, 63¢-65¢; 14, 66¢-74¢; 16, 76¢-81¢; 18, 84¢-89¢; 20, 96¢-1.01; 22, \$1.22-\$1.31; 24, \$1.62-\$1.76. Specification grade higher.

Extruded Round Rod: M, diam. in., 1/4 to 0.311, 58¢; 1/2 to 3/4, 46¢; 1 1/4 to 1.749, 43¢; 2 1/4 to 5, 41¢. Other alloys higher.

Extruded Square, Hex. Bar: M, size across flats, in., 1/4 to 0.311, 61¢; 1/2 to 0.749, 48¢; 1 1/4 to 1.749, 44¢; 2 1/4 to 4, 42¢. Other alloys higher.

Extruded Solid Shapes, Rectangles: M, in weight per ft. for perimeters of less than size indicated, 0.10 to 0.11 lb. per ft. per. up to 3.5 in., 55¢; 0.22 to 0.25 lb. per ft. per. up to 5.9 in., 51¢; 0.50 to 0.59 lb. per ft. per. up to 8.6 in., 47¢; 1.8 to 2.59 lb. per ft. per. up to 19.5 in., 44¢; 4 to 6 lb. per ft. per. up to 28 in., 43¢. Other alloys higher.

Extruded Round Tubing: M, wall thickness, outside diam. in., 0.049 to 0.057, 1/4 to 5/16, \$1.14; 5/16 to 3/8, \$1.02; 3/8 to 1/2, 76¢; 1 to 2 in., 65¢; 0.065 to 0.082, 3/4 to 7/16, 85¢; 3/4 to 1, 62¢; 1 to 2 in., 57¢. 0.165 to 0.219, 3/4 to 1, 54.5¢; 1 to 2 in., 53¢; 3 to 4 in., 49¢. Other alloys higher.

Nickel and Monel

(Base prices, cents per lb, f.o.b. mill)

	Nickel	Monel
Sheets, cold-rolled	60	47
Strip, cold-rolled	66	59
Rods and shapes		
Hot-rolled	56	45
Cold-drawn	56	45
Angles, hot-rolled	56	45
Plates	58	46
Seamless tubes	89	80
Shot and blocks		40

Copper, Brass, Bronze

(Cents per pound, freight prepaid on 200 lb)

	Sheets	Rods	Extruded Shapes
Copper	31.68		31.28
Copper, hot-rolled		27.53	
Copper, drawn		28.78	
Low brass	30.17	29.86	33.08*
Yellow brass	29.10	28.79	32.11*
Red brass	30.51	30.20	33.42*
Naval brass	34.15	28.21	29.46
Leaded brass		23.69	27.89
Commercial bronze	31.38	31.07	34.04*
Manganese bronze	37.65	31.55	33.05
Phosphor bronze, 5 pct	50.82	51.07	
Muntz metal	32.13	27.74	28.99
Everdur, Hercu-loy, Olym-ple, etc.	36.55	35.47	
Nickel silver, 10 pct	39.83	42.24	42.41
Architectural bronze			27.89
*Seamless tubing			

Scrap Metals

Brass Mill Scrap

(Cents per pound; add 1/2¢ per lb for shipments of 20,000 to 40,000 lb; add 1¢ for more than 40,000 lb)

	Heavy	Turn- ings
Copper	15 1/2	14 1/2
Yellow brass	13 1/2	12 1/2
Red brass	14 1/2	13 1/2
Commercial bronze	14 1/2	13 1/2
Manganese bronze	13 1/2	12 1/2
Leaded brass rod ends	13	

Custom Smelters' Scrap

(Cents per pound, carload lots, delivered to refinery)

No. 1 copper wire	13.50
No. 2 copper wire	12.50
Light copper	11.50
Refinery brass	11.50*
Radiators	7.625
*Dry copper content.	

Ingot Makers' Scrap

(Cents per pound, carload lots, delivered to producer)

No. 1 copper, wire	13.50
No. 2 copper, wire	12.50
Light copper	11.50
No. 1 composition	10.00
No. 1 comp. turnings	9.50
Rolled brass	8.75
Brass pipe	9.00
Radiators	8.00
Heavy yellow brass	7.50

Aluminum

Mixed old cast	8.50
Mixed old clips	8.50
Mixed turnings, dry	7.00
Pots and pans	8.50
Low copper	12.00

Dealers' Scrap

(Dealers' buying prices, f.o.b. New York in cents per pound)

	Copper and Brass
No. 1 heavy copper and wire	11 1/2 — 11 1/4
No. 2 heavy copper and wire	10 1/2 — 10 1/4
Light copper	9 1/2 — 9 1/4
Auto radiators (unsweated)	6 1/2 — 6 3/4
No. 1 composition	8 1/2 — 8 3/4
No. 1 composition turnings	8 1/2 — 8 1/4
Clean red car boxes	7 1/2 — 7 1/4
Cocks and faucets	7 1/2 — 7 3/4
Mixed heavy yellow brass	6 1/2 — 6 1/4
Old rolled brass	6 1/2 — 7
Brass pipe	7 1/2 — 8
New soft brass clippings	10 1/2 — 11
Brass rod ends	7 — 7 1/2
No. 1 brass rod turnings	6 — 6 1/2

Aluminum

Alum. pistons and struts	4 — 4 1/4
Aluminum crankcases	6 — 6 1/2
2S aluminum clippings	10 — 10 1/2
Old sheet and utensils	6 — 6 1/2
Borings and turnings	3 — 3 1/2
Misc. cast aluminum	6 — 6 1/2
Dural Clips (24S)	6 — 6 1/2

Zinc

New zinc clippings	6 — 6 1/4
Old zinc	4 1/2 — 5
Zinc routings	3 1/2 — 3 3/4
Old die cast scrap	— 3

Nickel and Monel

Pure nickel clippings	17 — 18
Clean nickel turnings	15 — 16
Nickel anodes	17 — 18
Nickel rod ends	17 — 18
New Monel clippings	12 1/2 — 13 1/2
Clean Monel turnings	7 — 8
Old sheet Monel	9 — 10
Old Monel castings	8 — 9
Inconel clippings	11 — 12
Nickel silver clippings, mixed	6 1/2 — 7 1/2
Nickel silver turnings, mixed	6 — 6 1/2

Lead

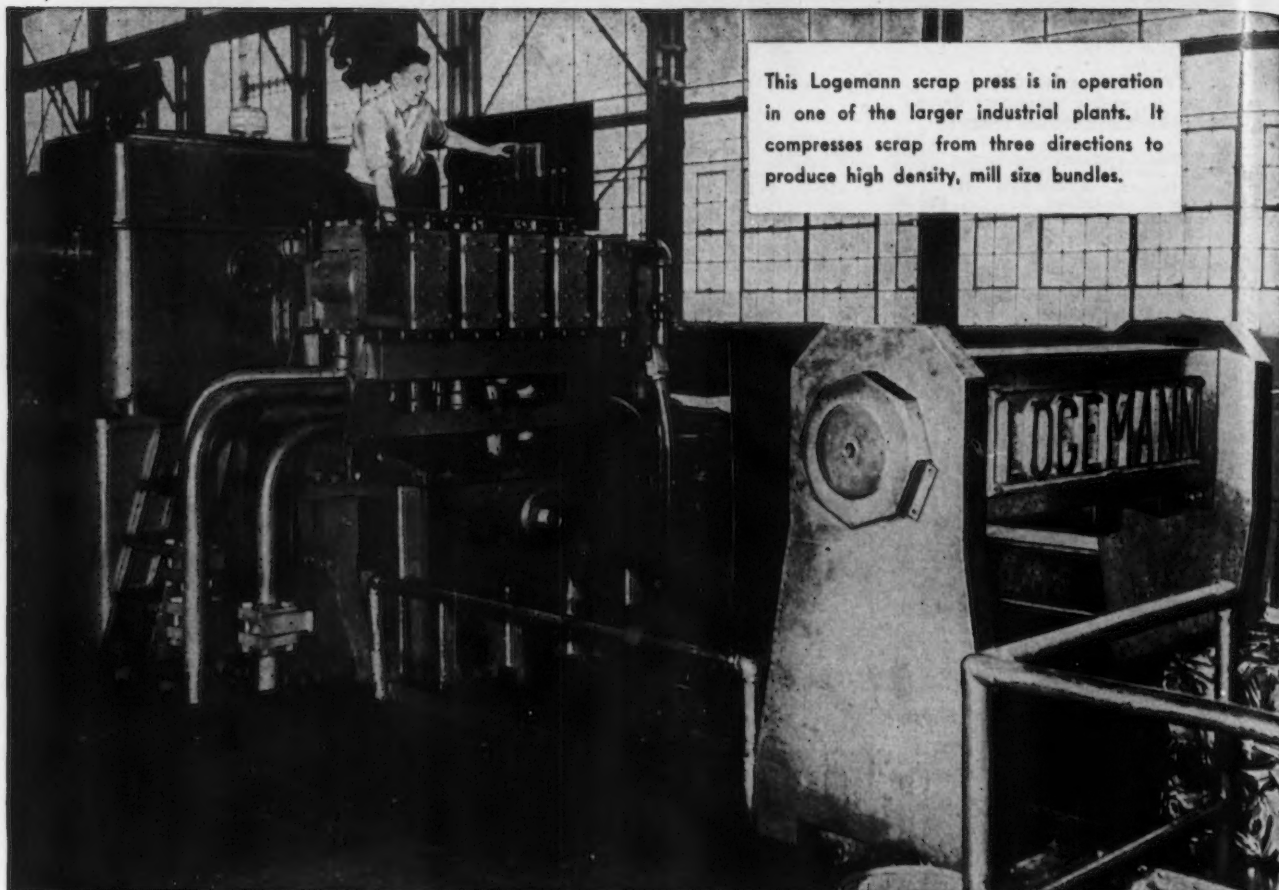
Soft scrap, lead	7 — 7 1/2
Battery plates (dry)	4 — 4 1/2

Magnesium Alloys

Segregated solids	9 — 10
Castings	5 1/2 — 6 1/2

Miscellaneous

Block tin	70 — 72
No. 1 pewter	47 — 49
No. 1 auto babbitt	40 — 42
Mixed common babbitt	8 1/4 — 9 1/4
Solder joints	11 — 11 1/2
Siphon tops	45 — 47
Small foundry type	11 1/2 — 12
Monotype	10 1/2 — 11
Lino. and stereotype	10 — 10 1/4
Electrotype	7 1/2 — 8
New type shell cuttings	9 1/4 — 9 1/2
Hand picked type shells	4 1/2 — 5
Lino. and stereo. dross	4 — 7
Electro. dross	4 — 4 1/4



This Logemann scrap press is in operation in one of the larger industrial plants. It compresses scrap from three directions to produce high density, mill size bundles.

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Triple Compression . . .
Automatically Controlled } **LOGEMANN**
SCRAP PRESSES

handle high tonnages with minimum labor . . . at low cost

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... are built in a large range of sizes to meet specific conditions. Let Logemann's engineering service help you arrive at the most efficient and economical way of handling your scrap.

The compact unit illustrated is completely self-contained with oil tank and pump located directly over the press . . . utilizing the advantages of short pipe lines. Automatic controls, mounted in front of pump, give the operator full visibility at all times. Controls operate rams successively within a single rigid box. There is no complex construction which means there is *no need for specially-trained maintenance crews.*

Both two-ram and three-ram models are available with automatic controls or for manual manipulation.

Logemann Bros. Co. have specialized in the production of scrap metal presses for sheet mills, stamping plants, scrap yards, and metal manufacturing plants of all types for nearly 75 years. Write for full information — please state the nature of your scrap and tonnage.

LOGEMANN BROTHERS COMPANY
3164 W. Burleigh Street Milwaukee 10, Wisconsin

Market Sags Badly, Appears Glutted

New York

... The market which had shown signs of leveling off was somewhat weaker this week. Some consumers are buying on a limited basis and others are completely out of the market. Mills are doing a little buying but nothing that would set a definite price trend.

THE IRON AGE scrap composite dropped 67¢ per gross ton to \$22.08 per gross ton which is a new low for the year. This represents a drop of \$20.92 per gross ton since the first of the year. Prices for No. 1 heavy melting steel this week are: Pittsburgh, \$22.50 to \$23; Chicago, \$21 to \$22; and Philadelphia, \$21.50 to \$22.50.

The major break was in the Chicago market where No. 1 heavy melting was off \$2. Prices in other areas indicated a lack of interest on the part of the consumer to buy at today's quotations. Some consumers have indicated that they will be out of the market during May and June.

Brokers are having trouble placing orders. Some consumers have been buying directly from the scrap source without any broker participation. Broker opinions are mixed as to whether there has only been a temporary halt in declining scrap prices.

On some items there have been more offerings than buyers would be willing to take and this has resulted in lower prices. High-priced inventories are not being mentioned any more as one of the reasons for not buying scrap. Probably with a smaller order backlog and fewer new orders it does not pay to stockpile. Scrap consumers feel confident that there will be plenty of scrap when needed.

PITTSBURGH—In separate sales, each of less than 500 tons, No. 1 heavy melting steel moved here during the past week at both \$22.50 and \$23.50 per ton, leaving this grade unchanged for the week. A down-river purchase of No. 2 steel confirms the going Pittsburgh delivered quotation on this grade. Malleable was off another \$1 for the week, based on broker buying. Good industrial scrap is again being offered for June from Michigan in about the same tonnage as May offerings. Cast business is dull because foundries are averaging about 40 pct of capacity and most are living off inventory.

CHICAGO—The \$2 drop in scrap last week didn't surprise too many people. The market is now back to where it was 1 month ago. Prices of turnings and borings are confused. Carnegie buying short shoveling turnings at \$16 will only accept this item direct from industry. The market on mixed borings and turnings has almost ceased to exist. In this week's issue No. 1 bundles have been changed to read factory bundles. The mills will not buy such bundles from a yard. Yards have been forced to ship their No. 1 bundles at No. 2 bundle price and all recent mill orders for No. 1 bundles carry the instructions "industrial only." Some railroad specialties showed further price declines and trading in cast scrap showed no signs of picking up.

PHILADELPHIA—Inactivity in the market created a feeling of further weakness last week, particularly when one mill that had been paying 40¢ a ton to equalize freight charges discontinued this practice. There is no turnings business, and some factors are expecting the next order to be placed at a lower price. There has been no low phos. business placed in more than a month. Cast grades are still firm. There were no price changes, but railroad specialties and electric furnace bundles are being quoted lower to reflect apathetic market conditions. Another furnace was taken off last week by one mill here.

CLEVELAND—Blast furnace grades continue firm at quoted prices here and in the Valley in an otherwise inactive market. According to dealers, May has been the worst month for them since 1938. Mills are taking small tonnages at various consuming points, but the major consumer in the area will be out of the market until July 1 and perhaps longer. The plant vacation period is at hand and foundries are interested only in occasional tonnages—all of which makes it look like a long dull summer for the scrap trades. Future price weakness here will probably stem from the strikes, although automobile and railroad lists are not expected to reach last month's levels.

CINCINNATI—Trading is at a very low ebb here in a market substantially unchanged from last week. With the exception of blast furnace, all grades are in long supply with demand very weak. One mill is taking limited tonnages but others are either holding up shipment or are out of the market. Foundries are simply not interested. Unprepared material is going very cheap, making stockpiling a possibility. Also, it will be difficult for the market here to go much lower with present freights, as prices are already too close to the cost of preparation on some grades.

DETROIT—Dealer grades of scrap continue on the weak side here as buying remains light. Most important development here is the growing indication of dealer resistance to present prices and

persistent reports that many scrap sources, particularly in the outstate areas, are drying up. Another interesting Detroit development is the reported substantial increase of direct buying by mills from large industrial plants. Local dealers insist not only that the amount of direct buying has increased but that price differentials are substantially higher than those in the prewar era.

NEW YORK—This week the market was very quiet with little interest shown. Some mills are doing a little buying but only enough to see if present prices have been stabilized. Some of the small orders are for short delivery only. There was no market support and most of the list weakened. No. 1 heavy melting was off 50¢. Some of the cast grades were down \$1. Clean cast chemical borings for which there is very little demand at present was also off \$1.

ST. LOUIS—The scrap iron market is full. There is no buying by either the mills or the foundries. Prices are unchanged, and the market has about leveled off. The movement is light, as country dealers say that present prices make it unprofitable to handle the material. The Missouri Pacific has a list of 89 carloads.

BOSTON—If there is anything at all to report from this city, it is to the effect that there are fewer orders, and prices are still low and uncertain. No. 1 steel continues at \$14.25 to \$14.50 which is as low as it has been. For many products such as No. 2 steel and shoveling turnings there is hardly a market at all. And in cast, the situation is as bad as it has been for many months, dealers being unwilling to quote a price.

BIRMINGHAM—Activity in this scrap market is at its lowest point since the end of the war. The only material moving is railroad scrap and no large tonnages of that. There's no demand whatever for cast grades or foundry steel grades. Lack of demand for cast reflects reduced operations at pressure and soil pipe plants at Birmingham and Anniston.

BUFFALO—No. 1 heavy melting steel dropped \$1 and blast furnace and other steelmaking grades slipped 50¢ this week without attracting much attention. Chief interest centered in Ottawa action barring Buffalo scrap from Canada while permitting heavy shipments from Jersey City by the barge canal from Michigan Point by lake. The Dominion government's objections to the Buffalo shipments reportedly are based on the fact that they would be made by rail while the Jersey and Michigan stuff is moving in by the cheaper water routes. However, local dealers point out that most of the canal scrap is transferred to railroad cars at Buffalo for shipment by rail to Hamilton and Welland. They feel that an outlet to Canada would take the heat off this market and check the steady decline that has been under way since January.

IRON AND STEEL SCRAP PRICES

PITTSBURGH

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$22.50 to \$23.00
R.R. hvy. melting	24.50 to 25.00
No. 2 hvy. melting	20.50 to 21.00
No. 2 bundles	18.50 to 19.00
RR. scrap rails	26.50 to 27.00
Rails 2 ft and under	32.00 to 32.50
No. 1 comp'd bundles	22.50 to 23.00
Hand bldd. new shts.	20.50 to 21.00
Hvy. steel forge turn	20.50 to 21.00
Mach. shop turn.	15.50 to 16.00
Shoveling turn.	18.00 to 18.50
Mixed bor. and ms. turn.	15.00 to 15.50
Cast iron borings	18.00 to 18.50
No. 1 mach. cast.	27.50 to 28.00
Mixed yard cast.	22.00 to 22.50
Hvy. breakable cast.	22.50 to 23.00
Malleable	26.50 to 27.00
RR. knuck. and coup.	27.50 to 28.00
RR. coil springs	27.50 to 28.00
RR. leaf springs	27.50 to 28.00
Rolled steel wheels	27.50 to 28.00
Low phos.	25.00 to 25.50

CHICAGO

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$21.00 to \$22.00
No. 2 hvy. melting	19.00 to 20.00
Factory bundles	21.00 to 22.00
No. 2 dealers' bundles	17.00 to 18.00
Mach. shop turn.	12.00 to 13.00
Short shov. turn.	15.00 to 16.00
Cast iron borings	14.00 to 15.00
Mix. borings and turn.	10.00 to 12.00
Low phos. hvy. forge	25.00 to 25.50
Low phos. plates	24.00 to 24.50
No. 1 RR. hvy. melt.	22.00 to 23.00
Revolving rails	27.00 to 28.00
Miscellaneous rails	25.00 to 26.00
Angles & splice bars	28.00 to 29.00
Locomotive tires, cut	31.00 to 32.00
Cut bolster & side frames	31.00 to 32.00
Standard stl. car axles	28.00 to 29.00
No. 3 steel wheels	26.00 to 27.00
Couplers and knuckles	26.00 to 27.00
Rails, 2 ft and under	30.00 to 31.00
Malleable	24.00 to 26.00
No. 1 mach. cast	26.00 to 28.00
No. 1 agricul. cast.	25.00 to 26.00
Heavy breakable cast.	22.00 to 23.50
RR. grate bars	18.00 to 19.00
Cast iron brake shoes	19.00 to 20.00
Cast iron car wheels	27.00 to 28.00

CINCINNATI

Per gross ton, f.o.b. cars:	
No. 1 hvy. melting	\$20.00 to \$21.00
No. 2 hvy. melting	19.00 to 20.00
No. 1 bundles	19.00 to 20.00
No. 2 bundles	17.00 to 18.00
Mach. shop turn.	9.00 to 10.00
Shoveling turn.	10.00 to 11.00
Cast iron borings	10.00 to 11.00
Mixed bor. & turn.	9.00 to 10.00
Low phos. 18 in. under	26.00 to 27.00
No. 1 cupola cast.	27.00 to 28.00
Hvy. breakable cast.	19.00 to 20.00
Rails 18 in. and under	32.00 to 32.50
Rails random length	22.00 to 23.00
Drop broken	30.00 to 31.00

BOSTON

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$14.25 to \$14.50
No. 2 hvy. melting	12.50
No. 1 bundles	13.50 to 14.50
No. 2 bundles	12.00 to 12.50
Bushelings	12.00 to 12.50
Shoveling turn.	9.50 to 10.00
Mach. shop turn.	5.50 to 6.00
Mixed bor. and turn.	5.50 to 6.00
Cl'n cast chem. bor.	10.00 to 12.00
No. 1 machinery cast.	27.00 to 32.00
No. 2 machinery cast.	24.00 to 26.00
Heavy breakable cast.	17.00 to 20.00
Stove plate	20.50 to 21.50

DETROIT

Per gross ton, brokers' buying prices f.o.b. cars:	
No. 1 hvy. melting	\$16.50 to \$17.00
No. 2 hvy. melting	13.00 to 13.50
No. 1 bundles	16.50 to 17.00
New busheling	15.50 to 16.00
Flashings	15.50 to 16.00
Mach. shop turn.	9.50 to 10.00
Shoveling turn.	10.50 to 11.00
Cast iron borings	10.50 to 11.00
Mixed bor. & turn.	9.50 to 10.00
Low phos. plate	16.50 to 17.00
Heavy breakable cast.	13.00 to 17.00
Stove plate	16.00 to 17.00
Automotive cast.	22.00 to 24.00
No. 1 cupola cast.	19.00 to 23.00

Going prices as obtained in the trade by THE IRON AGE, based on representative tonnages.

PHILADELPHIA

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$21.50 to \$22.50
No. 2 hvy. melting	19.00 to 20.00
No. 1 bundles	21.50 to 22.50
No. 2 bundles	17.00 to 18.00
Mach. shop turn.	12.00 to 13.00
Shoveling turn.	15.00 to 16.00
Mixed bor. and turn.	11.00 to 12.00
Clean cast chemical bor.	21.00 to 22.00
No. 1 machinery cast.	27.00 to 29.00
No. 1 mixed yard cast.	25.00 to 27.00
Hvy. breakable cast.	27.00 to 28.00
Hvy. axle forge turn.	20.00 to 21.00
Low phos. acid openhearth	24.00 to 25.00
Low phos. electric furnace	26.00 to 27.00
Low phos. bundles	22.00 to 23.00
RR. steel wheels	24.00 to 25.00
RR. coil springs	24.00 to 25.00
RR. malleable	24.00 to 28.00
Cast iron carwheels	29.00 to 30.00

ST. LOUIS

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$21.00 to \$22.00
No. 2 hvy. melting	19.00 to 20.00
No. 2 bundled sheets	19.00 to 20.00
Mach. shop turn.	13.00 to 14.00
Shoveling turnings	13.00 to 14.00
Locomotive tires, uncut	23.00 to 24.00
Mis. std. sec. rails	22.00 to 23.00
Steel angle bars	26.00 to 27.00
Rails 3 ft and under	29.00 to 30.00
RR. steel springs	24.00 to 25.00
Steel car axles	25.00 to 27.00
Brake shoes	21.00 to 22.00
Malleable	23.00 to 24.00
Cast iron car wheels	26.00 to 28.00
No. 1 machinery cast.	29.00 to 30.00
Hvy. breakable cast.	19.00 to 20.00
Stove plate	22.00 to 23.00

BIRMINGHAM

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	20.00
No. 2 bundles	18.00
No. 1 busheling	20.00
Long turnings	14.00
Shoveling turnings	17.00
Cast iron borings	17.00
Bar crops and plate	\$24.00 to 25.00
Structural and plate	24.00 to 25.00
No. 1 cupola cast.	27.00 to 28.00
Stove Plate	24.00 to 25.00
No. 1 RR. hvy. melt.	21.00
Steel axles	26.00 to 27.00
Scrap rails	23.00
Revolving rails	27.00
Angles & splice bars	24.00 to 25.00
Rails 2 ft & under	25.00 to 26.00
Cast iron carwheels	29.00 to 30.00

YOUNGSTOWN

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$23.50 to \$24.00
No. 2 hvy. melting	20.50 to 21.00
No. 1 bundles	23.50 to 24.00
No. 2 bundles	19.00 to 19.50
Mach. shop turn.	13.50 to 14.00
Short shov. turn.	18.50 to 19.00
Cast iron borings	18.50 to 19.00
Low phos.	24.50 to 25.00

NEW YORK

Brokers' buying prices per gross ton, on cars:	
No. 1 hvy. melting	\$14.50 to \$15.50
No. 2 hvy. melting	12.50 to 13.50
No. 2 bundles	11.50 to 12.50
Mach. shop turn	7.00 to 7.50
Mixed bor. turn.	7.00 to 7.50
Shoveling turnings	9.00 to 9.50
Machinery cast.	21.00 to 22.00
Mixed yard cast.	19.25 to 20.00
Heavy breakable cast.	20.00 to 21.00
Charging box cast	20.00 to 21.00
Unstrp. motor blks.	15.50 to 16.50
Cl'n cast chem. bor.	11.00 to 13.00

BUFFALO

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$21.00 to \$22.50
No. 2 hvy. melting	19.00 to 19.50
No. 1 bundles	19.00 to 19.50
No. 2 bundles	17.00 to 17.50
No. 1 busheling	19.00 to 19.50
Mach. shop turn.	11.50 to 12.50
Shoveling turn.	16.00 to 16.50
Cast iron borings	16.00 to 16.50
Mixed bor. and turn.	16.00 to 16.50
Cupola cast.	29.00 to 30.00
Mixed yard cast.	27.00 to 28.00
Stove plate	27.00 to 28.00
Small indus. malleable	20.00 to 21.00
Low phos. plate	22.50 to 23.50
Scrap rails	25.00 to 26.00
Rails 3 ft & under	32.00 to 33.00
RR. steel wheels	28.00 to 29.00
RR. coil & leaf spgs.	28.00 to 29.00
RR. knuckles & coup.	28.00 to 29.00

CLEVELAND

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$22.50 to \$23.00
No. 2 hvy. melting	18.00 to 18.50
No. 1 bundles	22.50 to 23.00
No. 2 bundles	16.00 to 16.50
No. 1 busheling	22.50 to 23.00
Drop forge flashings	12.50 to 13.00
Mach. shop turn.	18.00 to 18.50
Shoveling turn.	19.50 to 20.00
Steel axle turn.	18.00 to 18.50
Cast iron borings	18.00 to 18.50
Mixed bor. & turn.	23.50 to 24.00
Low phos. 2 ft and under	28.00 to 29.00
No. 1 mach. cast	22.00 to 23.00
Malleable	28.00 to 29.00
RR. cast	20.00 to 21.00
Railroad grate bars	20.00 to 21.00
Stove plate	23.50 to 24.00
RR. hvy. melting	31.00 to 32.00
Rails 3 ft and under	31.00 to 32.00
Rails 18 in. and under	32.00 to 33.00

SAN FRANCISCO

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bales	16.00
No. 2 bales	16.00
No. 3 bales	13.00
Mach. shop turn.	12.00
Elec. fur. 1 ft under	30.00
No. 1 cupola cast.	\$20.00 to 25.00
RR. hvy. melting	20.00
Rails	23.00

LOS ANGELES

Per gross ton delivered to consumer:	
No. 1 hvy. melting	\$20.00
No. 2 hvy. melting	18.00
No. 1 bales	16.00
No. 2 bales	16.00
No. 3 bales	13.00
Mach. shop turn.	12.00
Elec. fur. 1 ft under	30.00
No. 1 cupola cast.	\$24.00 to 26.00
RR. hvy. melting	20.00

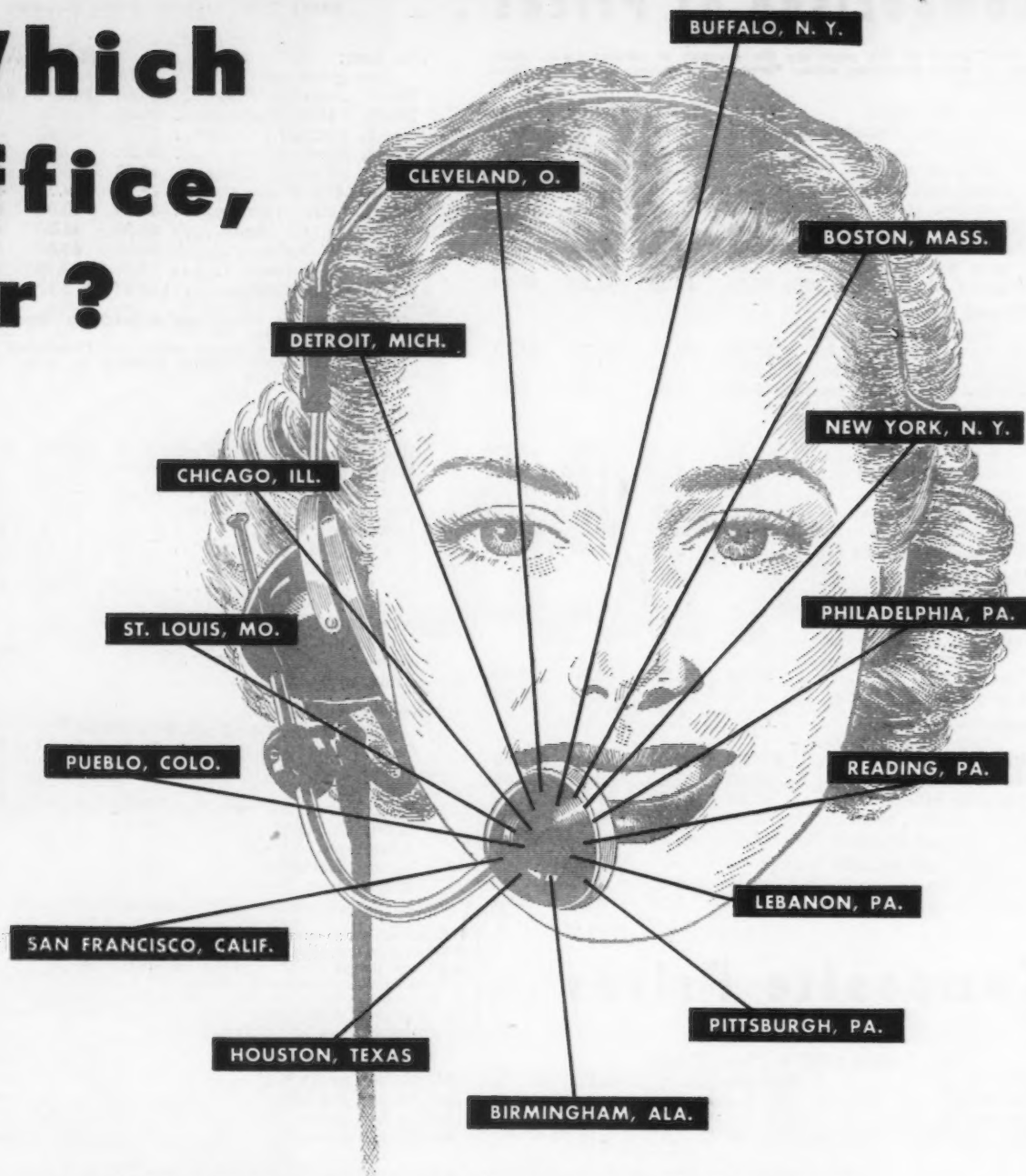
SEATTLE

Per gross ton delivered to consumer:	
No. 1 & No. 2 hvy melt	\$20.00
No. 1 & No. 2 bales	16.00
No. 3 bales	13.00
Elec. fur. 1 ft and under	30.00
No. 1 cupola cast.	\$28.00 to 30.00
RR. hvy. melting	20.00

HAMILTON, ONT.

Per gross ton delivered to consumer: Cast grades f.o.b. shipping point:	
Heavy melting	\$23.00*
No. 1 bundles	23.00*
No. 2 bundles	22.50*
Mechanical bundles	21.00*
Mixed steel scrap	19.00*
Mixed borings and turnings	17.00*
Rails, remelting	23.00*
Rails, rerolling	26.00*
Bushelings	17.50*
Bushelings, new fact. prop'd	21.00*
Bushelings, new fact. unprop'd	16.00*
Short steel turnings	17.00*
No. 1 cast.	\$48.00 to 50.00
No. 2 cast.	44.00 to 45.00
*Ceiling Price.	

Which office, sir?



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LEADERS IN IRON AND STEEL SCRAP SINCE 1889

Comparison of Prices . .

Price advances over previous week are printed in Heavy Type; declines appear in *Italics*.

Steel prices on this page are the average of various f.o.b. quotations of major producing areas: Pittsburgh, Chicago, Gary, Cleveland, Youngstown.

Flat-Rolled Steel:	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
(cents per pound)				
Hot-rolled sheets	3.25	3.25	3.25	2.775
Cold-rolled sheets	4.00	4.00	4.00	3.495
Galvanized sheets (10 ga.)	4.40	4.40	4.40	3.913
Hot-rolled strip	3.25	3.25	3.25	2.775
Cold-rolled strip	4.038	4.038	4.038	3.535
Plates	3.40	3.40	3.42	2.93
Plates wrought iron	7.85	7.85	7.85	7.25
Stains C-R strip (No. 302)	33.25	33.25	33.25	30.50

Tin and Terneplate:	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
(dollars per base box)				
Tinplate (1.50 lb) cokes	\$7.75	\$7.75	\$7.75	\$6.70
Tinplate, electro (0.50 lb)	6.70	6.70	6.70	5.90
Special coated mfg. ternes	6.65	6.65	6.65	5.80

Bars and Shapes:	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
(cents per pound)				
Merchant bars	3.35	3.35	3.35	2.875
Cold-finished bars	3.995	3.995	3.995	3.483
Alloy bars	3.75	3.75	3.75	3.213
Structural shapes	3.25	3.25	3.25	2.767
Stainless bars (No. 302)	28.50	28.50	28.50	26.00
Wrought iron bars	9.50	9.50	9.50	8.65

Wire:	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
(cents per pound)				
Bright wire	4.15	4.15	4.15	3.608

Rails:	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
(dollars per 100 lb)				
Heavy rails	\$3.20	\$3.20	\$3.20	\$2.725
Light rails	3.55	3.55	3.55	3.05

Semifinished Steel:	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
(dollars per net ton)				
Rerolling billets	\$52.00	\$52.00	\$52.00	\$45.00
Slabs, rerolling	52.00	52.00	52.00	45.00
Forging billets	61.00	61.00	61.00	54.00
Alloy blooms, billets, slabs	63.00	63.00	63.00	66.00

Wire rod and Skelp:	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
(cents per pound)				
Wire rods	3.40	3.40	3.40	3.133
Skelp	3.25	3.25	3.25	2.88

Pig Iron:	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
(per gross ton)				
No. 2, foundry, Phila.	\$50.56	\$50.56	\$50.65	\$44.74
No. 2, Valley furnace	46.50	46.50	46.50	39.50
No. 2, Southern Cin'ti*	45.47	45.47	49.47	45.47
No. 2, Birmingham	39.38	39.38	43.38	39.38
No. 2, foundry, Chicago†	46.50	46.50	46.50	39.00
Basic del'd Philadelphia*	49.74	49.74	49.81	44.24
Basic, Valley furnace	46.00	46.00	46.00	39.00
Malleable, Chicago†	46.50	46.50	46.50	39.50
Malleable, Valley	46.50	46.50	46.50	39.50
Charcoal, Chicago	73.78	73.78	73.78	62.55
Ferromanganese†	173.40	173.40	173.40	145.00

† The switching charge for delivery to foundries in the Chicago district is \$1 per ton.
 ‡ Average of U. S. prices quoted on Ferroalloy page.
 * Does not include interim increase on total freight charges effective Jan. 11, 1949.

Scrap	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
(per gross ton)				
Heavy melt'g steel, P'gh.	\$22.75	\$22.75	\$23.75	\$40.25
Heavy melt'g steel, Phila.	22.00	22.00	22.00	42.50
Heavy melt'g steel, Ch'go	21.50	23.50	23.00	39.25
No. 1, hy. comp. sh't, Det.	16.75	16.75	16.75	35.50
Low phos. Young'n	24.75	24.75	24.75	45.25
No. 1, cast, Pittsburgh	27.75	27.75	29.50	64.00
No. 1, cast, Philadelphia	28.00	28.00	28.00	67.00
No. 1, cast, Chicago	27.00	28.00	27.00	71.50

Coke, Connellsville:	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
(per net ton at oven)				
Furnace coke, prompt	\$14.25	\$14.25	\$14.50	\$12.50
Foundry coke, prompt	16.25	16.25	16.50	14.00

Nonferrous Metals:	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
(cents per pound to large buyers)				
Copper, electro, Conn.	18.00	18.00	21.50	21.50
Copper, Lake Conn.	18.625	18.625	23.625	21.625
Tin, Grade A, New York	\$1.03	\$1.03	\$1.03	94.00
Zinc, East St. Louis	12.00	12.00	13.00	11.00
Lead, St. Louis	12.85	13.85	14.80	17.30
Aluminum, virgin	17.00	17.00	17.00	15.00
Nickel, electrolytic	42.93	42.93	42.93	36.56
Magnesium, ingot	20.50	20.50	20.50	20.50
Antimony, Laredo, Tex.	38.50	38.50	38.50	35.00

Starting with the issue of May 12, 1949 the weighted finished steel composite was revised for the years 1941 to date. The weights used are based on the average product shipments for the 7 years 1937 to 1940 inclusive and 1946 to 1948 inclusive. The use of quarterly figures has been eliminated because it was too sensitive, see p. 139 of May 12, 1949 issue. The composite under the old method this week would have been 3.74583¢ per lb.

Composite Prices . .

FINISHED STEEL (Base Price)	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
May 24, 1949	3.705¢	3.705¢	3.705¢	3.705¢
One week ago	3.705¢	3.705¢	3.705¢	3.705¢
One month ago	3.708¢	3.708¢	3.708¢	3.708¢
One year ago	3.211¢	3.211¢	3.211¢	3.211¢

PIG IRON	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
May 24, 1949	\$45.91	\$45.91	\$45.91	\$45.91
One week ago	\$45.91	\$45.91	\$45.91	\$45.91
One month ago	\$46.57	\$46.57	\$46.57	\$46.57
One year ago	\$40.51	\$40.51	\$40.51	\$40.51

SCRAP STEEL	May 24, 1949	May 17, 1949	Apr. 26, 1949	May 25, 1948
May 24, 1949	\$22.08	\$22.08	\$22.08	\$22.08
One week ago	\$22.75	\$22.75	\$22.75	\$22.75
One month ago	\$22.92	\$22.92	\$22.92	\$22.92
One year ago	\$40.66	\$40.66	\$40.66	\$40.66

HIGH	LOW
1949.... 3.720¢ Jan. 1	3.705¢ May 3
1948.... 3.721¢ July 27	3.193¢ Jan. 1
1947.... 3.193¢ July 29	2.848¢ Jan. 1
1946.... 2.848¢ Dec. 31	2.464¢ Jan. 1
1945.... 2.464¢ May 29	2.396¢ Jan. 1
1944.... 2.396¢	2.396¢
1943.... 2.396¢	2.396¢
1942.... 2.396¢	2.396¢
1941.... 2.396¢	2.396¢
1940.... 2.30467¢ Jan. 2	2.24107¢ Apr. 16
1939.... 2.35367¢ Jan. 3	2.26689¢ May 16
1938.... 2.58414¢ Jan. 4	2.27207¢ Oct. 18
1937.... 2.58414¢ Mar. 9	2.32263¢ Jan. 4
1936.... 2.32263¢ Dec. 28	2.05200¢ Mar. 10
1935.... 2.07642¢ Oct. 1	2.06492¢ Jan. 8
1934.... 2.15367¢ Apr. 24	1.95757¢ Jan. 2
1933.... 1.95578¢ Oct. 3	1.75836¢ May 2
1932.... 1.89196¢ July 5	1.83901¢ Mar. 1
1931.... 1.99626¢ Jan. 13	1.86586¢ Dec. 29
1929.... 2.31773¢ May 28	2.26498¢ Oct. 29

Weighted index based on steel bars, shapes, plates, wire, rails, black pipe, hot and cold-rolled sheets and strip, representing major portion of finished steel shipments. Index recapitulated in Aug. 28, 1941, issue and in May 12, 1949.

HIGH	LOW
\$46.82 Jan. 4	\$45.91 May 10
46.91 Oct. 12	39.58 Jan. 6
37.98 Dec. 30	30.14 Jan. 7
30.14 Dec. 10	25.37 Jan. 1
25.37 Oct. 23	23.61 Jan. 2
\$23.61	\$23.61
23.61	23.61
23.61	23.61
\$23.61 Mar. 20	\$23.45 Jan. 2
23.45 Dec. 23	22.61 Jan. 2
22.61 Sept. 19	20.61 Sept. 12
23.25 June 21	19.61 July 6
23.25 Mar. 9	20.25 Feb. 16
19.74 Nov. 24	18.73 Aug. 11
18.84 Nov. 5	17.83 May 14
17.90 May 1	16.90 Jan. 27
16.90 Dec. 5	13.56 Jan. 3
14.81 Jan. 5	13.56 Dec. 6
15.90 Jan. 6	14.79 Dec. 15
18.71 May 14	18.21 Dec. 17

Based on averages for basic iron at Valley furnaces and foundry iron at Chicago, Philadelphia, Buffalo, Valley and Birmingham.

HIGH	LOW
\$43.00 Jan. 1	\$22.08 May 24
43.16 July 27	39.75 Mar. 8
42.58 Oct. 28	29.50 May 20
31.17 Dec. 24	19.17 Jan. 1
19.17 Jan. 2	18.92 May 22
19.17 Jan. 11	15.76 Oct. 24
\$19.17	\$19.17
19.17	19.17
\$22.00 Jan. 7	\$19.17 Apr. 10
21.83 Dec. 30	16.04 Apr. 9
22.50 Oct. 3	14.08 May 16
15.00 Nov. 22	11.00 June 7
21.92 Mar. 30	12.67 June 9
17.75 Dec. 21	12.67 June 8
13.42 Dec. 10	10.33 Apr. 29
13.00 Mar. 13	9.50 Sept. 25
12.25 Aug. 8	6.75 Jan. 3
8.50 Jan. 12	6.43 July 5
11.33 Jan. 6	8.50 Dec. 29
17.58 Jan. 29	14.08 Dec. 6

Based on No. 1 heavy melting steel scrap quotations to consumers at Pittsburgh, Philadelphia and Chicago.



SCRAP

IRON AND STEEL

Since 1898 — for over fifty years — the Alter Company has served the scrap consumer as well as the scrap producing industries and the scrap dealers.

During this half century, wars, peace, prosperity, inflation and depression have left their imprint of experience upon the policies and practices of the Alter Company.

If you have a scrap problem, we invite you to let us counsel with you. We promise you that your time will not be wasted.

Over 50 Years

ALTER

C O M P A N Y

1700 ROCKINGHAM ROAD - DAVENPORT 2, IOWA

Iron and Steel Prices . . .

Steel prices shown here are f.o.b. producing points in cents per pound unless otherwise indicated. Extras apply. (1) Widths up to 12-in. inclusive. (2) 0.25 carbon and less. (3) Cokes, 1.25 lb, deduct 25¢ per base box. (4) 18 gage and heavier. (5) For straight length material only from producers to fabricators. (6) Also shafting. For quantities of 40,000 lb and over. (7) Carload lot in manufacturing trade. (8) Hollowware enameling, gages 29 to 31 only. (9) Produced to dimensional tolerances in AISI Manual Sec. 6. (10) Slab prices subject to negotiation in most cases. (11) San Francisco only. (12) Los Angeles only. (13) San Francisco and Los Angeles only. (14) Seattle only. (15) Seattle and Los Angeles only.

PRODUCTS	Base prices at producing points apply to the sizes and grades produced in these areas													
	Pittsburgh	Chicago	Gary	Cleveland	Birmingham	Buffalo	Youngstown	Sparrows Point	Granite City	Middletown, Ohio		Detroit	Johnstown	Seattle, S. Frisco, Los Angeles
INGOTS														
Carbon forging	\$50.00													
Alloy	\$51.00							(per net ton)						
BILLETS, BLOOMS, SLABS														
Carbon, rerolling ¹⁰	\$52.00				\$52.00	\$52.00		(per net ton)					\$52.00	
Carbon forging billets	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00	\$61.00		(per net ton)					\$61.00	
Alloy	\$63.00	\$63.00				\$63.00		(Bethlehem, Canton, Massillon = \$63.00) (per net ton)						
PIPE SKELP	3.25						3.25				Warren = 3.25			
WIRE RODS	3.40	3.40		3.40	3.40		3.40	3.50			Worcester 3.70		3.40	4.05 ¹¹ 4.20 ¹²
SHEETS														
Hot-rolled ⁴	3.25	3.25	3.25	3.25	3.25	3.25 (Conshe)	3.25 hocken,	3.25 Pa. 3.35)		Warren, Ashland = 3.25		3.45		3.95 ¹³
Cold-rolled	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.00	4.20	4.00	Warren 4.00	4.20		Pittsburg, Cal. 4.95
Galvanized (10 gage)	4.40	4.40	4.40		4.40			4.40	Canton = 4.40	4.40	Ashland = 4.40			5.15 ¹³
Enameling (12 gage)	4.40	4.40	4.40	4.40			4.40		4.60	4.40		4.70		
Long ternes (10 gage)	4.60		4.60							4.60				
STRIP														
Hot-rolled ¹	3.25	3.25	3.25	3.25	3.25	3.25	3.25	3.25		3.25	Warren = 3.25	3.45		4.00 to 4.25
Cold-rolled ²	4.00	4.15		4.00		4.00	4.00	4.00			New Haven 4.50 Warren = 4.00 to 4.25	4.20 to 4.25		5.55
TINPLATE														
Cokes, 1.50 lb. ³ base box	\$7.75	\$7.75	\$7.75		\$7.85			\$7.85	\$7.95	Warren, Ohio = \$7.75				Pittsburg, Cal. = \$8.00
Electrolytic 0.25, 0.50, 0.75 lb. box	Deduct \$1.30, \$1.05 and 75¢ respectively from 1.50 lb. coke base box price													
TERNES MFG., special coated	Deduct \$1.10 from 1.50 lb. coke base box price													
BLACKPLATE CANMAKING 55 to 125 lb.	Deduct \$2.00 from 1.50 lb. coke base box price													
BLACKPLATE, h.s., 29 ga. ⁶	5.30	5.30	5.30					5.40		Warren, Ohio = 5.30				
BARS														
Carbon Steel	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35		3.35	Canton = 3.35	3.55	3.35	4.05
Reinforcing (billet) ⁵	3.35	3.35	3.35	3.35	3.35	3.35	3.35	3.35			Canton = 3.35		3.35	4.05 to 4.10
Cold-finished ⁶	3.95 to 4.00	4.00	4.00	4.00		4.00	4.00					4.30		
Alloy, hot-rolled	3.75	3.75	3.75			3.75	3.75		Bethlehem, Canton, Massillon = 3.75			4.05	3.75	4.60 ¹²
Alloy cold-drawn	4.65	4.65	4.65	4.65		4.65	4.65		Massillon = 4.65		Worcester 4.95			
PLATE														
Carbon steel ⁹	3.40	3.40	3.40	3.40	3.40 Cons	3.45 hocken = 3.55	3.40	3.45	Coatesville = 3.50, Claymont = 3.55 Geneva = 3.40, Harrisburg = 3.55			3.65	3.45	4.30 ¹⁴
Floor plates	4.55	4.55		4.55					Conshehocken = 4.55					
Alloy	4.40	4.40								Coatesville = 4.50				
SHAPES, Structural	3.25	3.25	3.25		3.25	3.30			Bethlehem = 3.30, Geneva, Utah = 3.25				3.30	3.80 to 3.90 ¹⁴
MANUFACTURERS' WIRE ⁷ Bright	4.15	4.15		4.15	4.15		4.15	4.25	Duluth = 4.15, Worcester = 4.45				4.15	5.15 ¹¹
Spring (high carbon)	5.20	5.20		5.20				5.30	Worcester = 5.50 New Haven, Trenton = 5.50				5.20	Duluth = 5.20-5.15
PILING, Steel sheet	4.05	4.05				4.05								

PRICES

STAINLESS STEELS

Base prices, in cents per pound, f.o.b. producing point

Product	Chromium Nickel							Straight Chromium		
	301	302	303	304	316	321	347	410	418	430
Ingot, re-rolling.....	12.75	13.50	15.00	15.50	22.75	18.25	20.00	11.25	13.75	11.50
Slabs, billets, re-rolling.....	17.00	18.25	20.25	19.25	30.25	24.50	26.75	15.00	18.50	15.25
Forg. discs, die blocks, rings.....	30.50	30.50	33.00	32.00	48.00	36.50	41.00	24.50	25.00	25.00
Billets, forging.....	24.25	24.25	26.25	25.50	39.00	29.00	32.75	19.50	20.00	20.00
Bars, wire, structurals.....	28.50	28.50	31.00	30.00	46.00	34.00	38.50	23.00	23.50	23.50
Plates.....	32.00	32.00	34.00	34.00	50.50	39.50	44.00	26.00	26.50	26.50
Sheets.....	37.50	37.50	39.50	39.50	53.00	45.50	50.00	33.00	33.50	35.50
Strip, hot-rolled.....	24.25	25.75	30.00	27.75	46.00	34.50	38.75	21.25	28.00	21.75
Strip, cold-rolled.....	30.50	33.00	36.50	35.00	55.00	44.50	48.50	27.00	33.50	27.50

ELECTRODES

Cents per lb. f.o.b. plant, threaded electrodes with nipples, unboxed

Diameter in in.	Length in in.	
Graphite		
17, 18, 20	60, 72	16.00¢
8 to 16	48, 60, 72	16.50¢
7	48, 60	17.75¢
6	48, 60	19.00¢
4, 5	40	19.50¢
3	40	20.50¢
2½	24, 30	21.00¢
2	24, 30	23.00¢
Carbon		
40	100, 110	7.50¢
35	65, 110	7.50¢
30	65, 84, 110	7.50¢
24	72 to 104	7.50¢
17 to 20	84, 90	7.50¢
14	60, 72	8.00¢
10, 12	60	8.25¢
8	60	8.50¢

TOOL STEEL

F.o.b. mill					Base per lb
W	Cr	V	Mo	Co	
18	4	1	—	—	90.5¢
18	4	1	—	5	\$1.42
18	4	2	—	—	\$1.025
1.5	4	1.5	8	—	65¢
6	4	2	6	—	69.5¢
High-carbon-chromium.....					52¢
Oil hardened manganese.....					29¢
Special carbon.....					26.5¢
Extra carbon.....					22¢
Regular carbon.....					19¢
Warehouse prices on and east of Mississippi are 2½¢ per lb higher. West of Mississippi, 4½¢ higher.					

ELECTRICAL SHEETS

2½ gage, HR cut lengths, f.o.b. mill

	Cents per lb
Armature.....	5.45
Electrical.....	5.95
Motor.....	6.70
Dynamo.....	7.50
Transformer 72.....	8.05
Transformer 65.....	8.60
Transformer 58.....	9.30
Transformer 52.....	10.10

RAILS, TRACK SUPPLIES

F.o.b. mill

Standard rails, 100 lb and heavier, No. 1 quality, per 100 lb.....	\$3.20†
Joint bars, 100 lb.....	4.25
Light rails (from billets) per 100 lb.....	3.55

Base Price cents per lb

Track spikes.....	5.35
Axles.....	5.20
Screw spikes.....	8.00
Tie plates.....	4.05
Tie plates, Pittsburg, Calif.*.....	4.20
Track bolts, untreated.....	8.25
Track bolts, heat treated, to railroads.....	8.50

*Seattle, add 30¢.

†CF&I, \$3.30.

C-R SPRING STEEL

Base per pound f.o.b. mill

0.26 to 0.40 carbon.....	4.00¢
0.41 to 0.60 carbon.....	5.50¢
0.61 to 0.80 carbon.....	6.10¢
0.81 to 1.05 carbon.....	8.05¢
1.06 to 1.35 carbon.....	10.35¢
Worcester, add 0.30¢.	

CLAD STEEL

Base prices, cents per pound

Stainless clad	Plate	Sheet
No. 304, 20 pct, f.o.b. Coatesville, Pa.....	*26.50	
Washington, Pa.....	*26.50	*22.50
Claymont, Del.....	*26.50	
Conshohocken, Pa.....		*22.50
Nickel-clad		
10 pct f.o.b. Coatesville, Pa.....	27.50	
Inconel-clad		
10 pct, f.o.b. Coatesville.....	36.00	
Monel-clad		
10 pct, f.o.b. Coatesville.....	29.00	
Aluminized steel sheets		
Hot dip, f.o.b. Butler, Pa.....		7.75

*Includes annealing and pickling, or sandblasting.

MERCHANT WIRE PRODUCTS

To the dealer, f.o.b. mill

	Base Column	Pittsburg, Calif.
Standard & coated nails* 103	123	
Galvanized nails*.....	103	123
Woven wire fence†.....	109	132
Fence posts, carloads††.....	114	130
Single loop bale ties.....	106	130
Galvanized barbed wire** 123	143	
Twisted barbed wire... 123	...	

*Pgh., Chi., Duluth; Worcester, 6 columns higher. †15½ gage and heavier. **On 80 rod spools, in carloads. ††Duluth only.

Base per 100 lb Pittsburg, Calif.

Annealed fence wire†.....	\$4.80	\$5.75
Annealed, galv. fencing†.....	5.25	6.20
Cut nails, carloads††.....	6.75	...

†Add 30¢ at Worcester; 10¢ at Sparrows Pt.
††Less 20¢ to jobbers.

HIGH STRENGTH, LOW ALLOY STEELS

Mill base prices, cents per pound

Steel	Aldecor	Corten	Double Strength No. 1	Dynalloy	Hi Steel	Mayari R	Otiscoloy	Yaloy	NAX High Tensile
Producer	Republic	Carnegie-Illinois, Republic, Sharon*	Republic	Alan Wood	Inland	Bethlehem	Jones & Laughlin	Youngtown Sheet & Tube	Great Lakes, Sharon*
Plates.....	5.20	5.20	5.20	5.30	5.20	5.30	5.20	5.20	5.45
Sheets									
Hot-rolled.....	4.95	4.95	4.95	4.95	4.95	4.95	4.95	4.95	5.15
Cold-rolled.....	8.05	8.05	8.05	.....	6.05	6.05	6.05	6.05	6.25
Galvanized.....	.....	6.75	.....	.....	.....	6.75	.....	.....	.....
Strip									
Hot-rolled.....	4.95	4.95	4.95	.....	4.95	4.95	4.95	4.95	5.15
Cold-rolled.....	.....	6.05	.....	.....	.....	6.05	6.05	6.05	6.25
Shapes.....									
.....	.....	4.95	.....	.....	4.95	5.05	4.95	4.95	.....
Beams.....									
.....	.....	4.95	.....	.....	.....	.....	.....	.....	.....
Bars									
Hot-rolled.....	5.10	5.10	5.10	.....	5.10	5.10	5.10	5.10	5.30
Bar shapes.....	.....	5.10	.....	.....	5.10	5.10	5.10	5.10	.....

*Sheets and strip.

PRICES

PIPE AND TUBING

Base discounts, f.o.b. mills,
Base price, \$200.00 per net ton.

STANDARD, THREADED AND COUPLED

Steel, butt weld	Black	Galv.
1/2-in.	43 to 41	25 1/2 to 23 1/2
3/4-in.	46 to 44	29 1/2 to 27 1/2
1-in.	48 1/2 to 46 1/2	32 1/2 to 30 1/2
1 1/4-in.	49 to 47	33 to 31
1 1/2-in.	49 1/2 to 47 1/2	33 1/2 to 31 1/2
2-in.	50 to 48	34 to 32
2 1/2 to 3-in.	50 1/2 to 48 1/2	34 1/2 to 32 1/2

Steel, lap weld		
2-in.	39 1/2	25 to 23
2 1/2 to 3-in.	43 1/2 to 42 1/2	27 to 26
3 1/2 to 6-in.	46 1/2 to 42 1/2	30 to 26

Steel, seamless		
2-in.	38 1/2 to 27	22 to 10 1/2
2 1/2 to 3-in.	41 1/2 to 32 1/2	25 to 16
3 1/2 to 6-in.	43 1/2 to 38 1/2	27 to 22

Wrought iron, butt weld		
1/2-in.	+20 1/2	+47
3/4-in.	+10 1/2	+36
1 & 1 1/4 in.	+4 1/2	+27
2-in.	+1 1/2	+23 1/2
3-in.	-2	+23

Wrought iron, lap weld		
2-in.	+7 1/2	+31
2 1/2 to 3 1/2-in.	+5	+26 1/2
4-in.	list	+20 1/2
4 1/2 to 8-in.	+2	+22

EXTRA STRONG, PLAIN ENDS

Steel, butt weld		
1/2-in.	42 to 40	26 to 24
3/4-in.	46 to 44	30 to 28
1-in.	48 to 46	33 to 31
1 1/4-in.	48 1/2 to 46 1/2	33 1/2 to 31 1/2
1 1/2-in.	49 to 47	34 to 32
2-in.	49 1/2 to 47 1/2	34 1/2 to 33 1/2
2 1/2 to 3-in.	50 to 48	35 to 33

Steel, lap weld		
2-in.	39 1/2 to 38 1/2	24 to 23
2 1/2 to 3-in.	44 1/2 to 42 1/2	29 to 27
3 1/2 to 6-in.	48 to 44	32 1/2 to 30 1/2

Steel, seamless		
2-in.	37 1/2 to 32 1/2	22 to 17
2 1/2 to 3-in.	41 1/2 to 36 1/2	26 to 22
3 1/2 to 6-in.	45	29 1/2

Wrought iron, butt weld		
1/2-in.	+16	+40
3/4-in.	+9 1/2	+34
1 to 2-in.	-1 1/2	+23

Wrought iron, lap weld		
2-in.	+4 1/2	+27 1/2
2 1/2 to 4-in.	-5	+16
4 1/2 to 6-in.	-1	+20 1/2

For threads only, butt weld, lap weld and seamless pipe, one point higher discount (lower price) applies. For plain ends, butt weld, lap weld and seamless pipe 3-in. and smaller, three points higher discount (lower price) applies, while for lap weld and seamless 3 1/4-in. and larger four points higher discount (lower price) applies. On butt weld and lap weld steel pipe, jobbers are granted a discount of 5 pct. On l.c.l. shipments, prices are determined by adding 25 pct and 30 pct and the carload freight rate to the base card.

BOILER TUBES

Seamless steel and electric welded commercial boiler tubes and locomotive tubes, minimum wall. Prices per 100 ft at mill in carload lots, cut length 4 to 24 ft inclusive.

OD Gage	Seamless	Electric Weld
in. BWG	H.R.	C.R.
2 1/2	13	19.18
3	12	25.79
3 1/2	12	28.68
4	11	35.85
4 1/2	10	44.51

CAST IRON WATER PIPE

	Per net ton
6 to 24-in., del'd Chicago	\$95.70
6 to 24-in., del'd N. Y.	\$92.50 to 97.40
6 to 24-in., Birmingham	82.50
6-in. and larger, f.o.b. cars, San Francisco, Los Angeles, for all rail shipment; rail and water shipment less	109.30
Class "A" and gas pipe, \$5 extra; 4-in. pipe is \$5 a ton above 6-in.	

BOLTS, NUTS, RIVETS, SET SCREWS

Consumer Prices

(Bolts and nuts f.o.b. mill Pittsburgh, Cleveland, Birmingham or Chicago)

Base discount less case lots

Machine and Carriage Bolts

	Pct Off List
1/2 in. & smaller x 6 in. & shorter	35
9/16 & 5/8 in. x 6 in. & shorter	37
3/4 in. & larger x 6 in. & shorter	34
All diam, longer than 6 in.	30
Lag, all diam over 6 in. longer	35
Lag, all diam x 6 in. & shorter	37
Flow bolts	47

Nuts, Cold Punched or Hot Pressed (Hexagon or Square)

1/2 in. and smaller	35
9/16 to 1 in. inclusive	34
1 1/4 to 1 1/2 in. inclusive	32
1 1/2 in. and larger	27
On above bolts and nuts, excepting plow bolts, additional allowance of 15 pct for full container quantities. There is an additional 5 pct allowance for carload shipments.	

Semifinished Hexagon Nuts

	USS	SAE
7/16 in. and smaller	41	
1/2 in. and smaller	38	
1/2 in. through 1 in.	39	
9/16 in. through 1 in.	37	
1 1/4 in. through 1 1/2 in.	35	37
1 1/2 in. and larger	28	
In full case lots, 15 pct additional discount.		

Stove Bolts

Packages, nuts separate	\$61.75
In bulk	70.00

Large Rivets

	(1/2 in. and larger)
	Base per 100 lb
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	\$6.75
F.o.b. Lebanon, Pa.	6.75

Small Rivets

	(7/16 in. and smaller)
	Pct Off List
F.o.b. Pittsburgh, Cleveland, Chicago, Birmingham	48

Cap and Set Screws

	(In packages)	Pct Off List
Hexagon head cap screws, coarse or fine thread, up to and incl. 1 in. x 6 in., SAE 1020, bright		46
1/2 to 1 in. x 6 in., SAE (1035), heat treated		35
Milled studs		19
Flat head cap screws, listed sizes		5
Fillister head cap, listed sizes		28

FLUORSPAR

Washed gravel fluorspar, f.o.b. cars, Rosiclare, Ill.

	Base price per net ton
Effective CaF ₂ Content:	
70% or more	\$37.00
60% or less	34.00

LAKE SUPERIOR ORES

(51.50% Fe, Natural Content, Delivered Lower Lake Ports)

	Per Gross Ton
Old range, bessemer	\$7.60
Old range, nonbessemer	7.45
Mesabi, bessemer	7.35
Mesabi, nonbessemer	7.20
High phosphorus	7.20
After Dec. 31, 1948, increases or decreases in Upper Lake freight, dock and handling charges and taxes thereon to be for the buyers' account.	

METAL POWDERS

Per pound, f.o.b. shipping point, 40 ton lots, for minus 100 mesh.

Swedish sponge iron c.i.f. New York, ocean bags	7.9¢ to 9.0¢
Domestic sponge iron, 98+ % Fe, carload lots	9.0¢ to 15.0¢
Electrolytic iron, annealed, 99.5+ % Fe	31.5¢ to 39.1¢
Electrolytic iron, unannealed, minus 325 mesh, 99+ % Fe	48.1¢
Hydrogen reduced iron, minus 300 mesh, 98+ % Fe	63.0¢ to 80.0¢
Carbonyl iron, size 5 to 10 microns, 98%, 99.8%+ Fe	90.0¢ to \$1.75
Aluminum	30.00 to 31.00¢
Antimony	51.17¢
Brass, 10 ton lots	22.75 to 25.75¢
Copper, electrolytic	28.125¢
Copper, reduced	28.00¢
Cadmium	\$2.40
Chromium, electrolytic, 99% min.	\$3.50
Lead	21.65¢
Manganese	55.00 to 60.00¢
Molybdenum, 99%	\$2.65
Nickel, unannealed	66.00¢
Nickel, spherical, minus 30 mesh, unannealed	68.00¢
Silicon	34.00¢
Solder powder	8.5¢ plus metal cost
Stainless steel, 302	75.00¢
Tin	\$1.25
Tungsten, 99%	\$2.90
Zinc, 10 ton lots	14.75 to 16.25¢

COKE

	Net Ton
Furnace, beehive (f.o.b. oven)	\$14.00 to \$14.50
Foundry, beehive (f.o.b. oven)	
Connellsville, Pa.	\$16.00 to \$16.50
Foundry, oven coke	
Buffalo, del'd	\$22.95
Chicago, f.o.b.	20.40
Detroit, f.o.b.	19.40
New England, del'd	22.70
Seaboard, N. J., f.o.b.	22.00
Philadelphia, f.o.b.	20.45
Swedeland, Pa., f.o.b.	20.40
Painesville, Ohio, f.o.b.	20.90
Erle, del'd	\$21.50 to 23.50
Cleveland, del'd	22.45
Cincinnati, del'd	21.50
St. Paul, f.o.b.	23.50
St. Louis, del'd	20.95
Birmingham, del'd	18.66

REFRACTORIES

(F.o.b. Works)

	Carloads, Per 1000
Fire Clay Brick	
First quality, Pa., Md., Ky., Mo., Ill. (except Salina, Pa., add \$5)	\$80.00
No. 1 Ohio	74.00
Sec. quality, Pa., Md., Ky., Mo., Ill.	74.00
No. 2 Ohio	66.00
Ground fire clay, net ton, bulk (except Salina, Pa., add \$1.50)	11.50
Silica Brick	
Mt. Union, Pa., Ensley, Ala.	\$80.00
Childs, Pa.	84.00
Hays, Pa.	85.00
Chicago District	89.00
Western, Utah and Calif.	95.00
Super Duty, Hays, Pa., Athens, Tex.	85.00
Silica cement, net ton, bulk, Eastern (except Hays, Pa.)	\$13.75 to 14.00
Silica cement, net ton, bulk, Hays, Pa.	16.00
Silica cement, net ton, bulk, Ensley, Ala.	15.00
Silica cement, net ton, bulk, Chicago District	14.75
Silica cement, net ton, bulk, Utah and Calif.	21.00
Chrome Brick	
Standard chemically bonded, Balt. Chester	\$69.00
Magnesite Brick	
Standard, Balt. and Chester	\$91.00
Chemically bonded, Balt. and Chester	80.00
Grain Magnesite	
Std. 1/2-in. grains	
Domestic, f.o.b. Balt. and Chester, in bulk, fines removed	\$56.50
Domestic, f.o.b. Chewelah, Wash., in bulk with fines	\$30.50 to 31.00
in sacks with fines	35.00 to 35.50
Dead Burned Dolomite	
F.o.b. producing points in Pennsylvania, West Virginia, and Ohio, per net ton, bulk, Midwest, add 10¢; Missouri Valley, add 20¢	\$12.1

PRICES

WAREHOUSE PRICES

Base prices, f.o.b. warehouse, dollars per 100 lb.
(Metropolitan area delivery, add 15¢ to base price except Cincinnati and New Orleans (*), add 10¢; New York, add 20¢.)

CITIES	SHEETS			STRIP		PLATES	SHAPES	BARS		ALLOY BARS			
	Hot-Rolled	Cold-Rolled (15 gage)	Galvanized (10 gage)	Hot-Rolled	Cold-Rolled			Hot-Rolled	Cold-Finished	Hot-Rolled, A 4615 As-rolled	Hot-Rolled, A 4140-50 Ann.	Cold-Drawn, A 4615 As-rolled	Cold-Drawn, A 4140-50 Ann.
Baltimore	5.31	6.21-6.41	6.95-7.11	5.37	....	5.56	5.36	5.42	6.16	....	9.60-10.10	....	....
Birmingham	5.05	....	6.45	5.05	6.68	5.25	5.00	5.00	6.68	....	....	....	....
Boston	5.55	6.45-6.75	7.11-7.81	5.65-5.95	6.75	5.80	5.42	5.52	6.27	9.67-9.75	10.04-10.07	11.23	11.47
Buffalo	4.85	5.75	7.45-7.57	5.30	7.27	5.35	5.10	5.05-5.15	5.90	9.60-9.70	9.85-9.95	11.15	11.40-11.45
Chicago	4.85	5.75	6.95-7.10	4.85	5.55-6.68	5.10	4.90	5.15-4.90	5.70	9.35	9.80	10.80	11.06
Cincinnati*	5.16-5.51	5.84-6.28	6.59-6.93	5.28-5.43	....	5.53-5.85	5.33	5.33-5.48	6.08-6.20	9.74	9.99	11.19	11.44
Cleveland	4.85-5.16	5.75-6.08	6.15-7.46	5.03-5.15	....	5.21-5.54	5.01-5.47	5.01-5.34	5.70-5.97	9.49-9.50	9.74-9.75	10.95	11.19-11.20
Detroit	5.28-5.32	6.07-6.18	7.38-7.58	5.27-5.47	6.27-6.58	5.52-5.57	5.33-5.40	5.33-5.55	6.00-6.10	9.67	9.92	11.11	11.35
Houston	6.70-6.95	....	7.30	6.70	....	6.70	6.20-6.70	6.40-6.65	7.60	10.45	10.40	11.45	11.70
Indianapolis	5.29	6.13	7.44	5.29	7.38	5.54	5.34	5.34	6.14	11.25	11.39	....	....
Los Angeles	6.45	7.80 ¹⁹ -7.90 ¹	8.05	6.65	8.35 ³	6.15	5.95	6.10	7.95 ¹⁴	10.95 ¹⁵	10.90 ¹⁵ -14.70	12.45 ¹⁵	12.70 ¹⁵ -16.45
Memphis	5.75-5.80	6.60	7.20	5.80-5.95	6.80	5.95-6.00	5.75	5.75	6.53	....	....	....	....
Milwaukee	5.03	5.93	7.13-7.18	5.03-5.38	6.86	5.28	5.08	5.08	5.88	9.53	9.78	10.98	11.23
New Orleans*	5.95	6.75	....	6.15	....	6.15	5.95	5.95	6.65 ⁶	....	....	....	....
New York	5.40	6.31-6.46	7.00	5.62-5.72	....	5.70	5.33	5.57	6.36-6.41	9.73	9.98	11.18	11.43
Norfolk	6.00	....	....	6.20	....	6.05	6.05	6.05	7.05	....	....	....	....
Omaha	6.13	....	8.33	6.13	....	6.38	6.18	6.18	6.98	....	....	....	....
Philadelphia	5.08	6.24 ¹³	6.73	5.45	6.69	5.38	5.10	5.40	6.19	9.70	9.75	10.95	11.20
Pittsburgh	4.85	5.75 ¹	6.95-7.15	5.00	6.00	5.05-5.10	4.90	4.90	5.65	9.35	9.80	10.80	11.05
Portland	6.50 ⁶ -6.90	8.00 ¹	8.80-9.10	6.85 ⁸	....	6.30 ⁸	6.35 ⁸	6.35 ⁸	8.25 ¹⁴	10.50 ⁶	10.10 ⁶	....	....
Salt Lake City	7.25 ³	8.20	8.80	7.65 ³	....	6.10 ³	5.70 ³	6.95 ⁸	8.30	....	....	....	....
San Francisco	6.15 ⁸	7.50 ²	7.90	6.75 ⁸	8.25 ³	6.35 ⁸	5.90 ⁸	5.90 ⁸	7.55	10.90 ¹⁵	10.85 ¹⁵	12.40 ¹⁵	12.65 ¹⁵
Seattle	6.70 ⁴	8.15 ²	8.80	6.70 ⁴	....	6.35 ⁴	6.30 ⁴	6.20 ⁴	8.15 ¹⁴	....	10.35 ¹⁵	....	13.10 ¹⁵
St. Louis	5.22-5.37	6.12 ¹ -6.27	7.32	5.22	6.68-7.54	5.47	5.27	5.27	6.07-6.22	9.72	9.97	11.17	11.42
St. Paul	5.44	6.18-6.34	7.64	5.44	6.82	5.64-6.69	5.49	5.49	6.29	....	....	....	....

BASE QUANTITIES

Standard unless otherwise keyed on prices.

HOT-ROLLED:

Sheets, strip, plates, shapes and bars, 400 to 1999 lb.

COLD-ROLLED:

Sheets, 400 to 1499 lb; strip, extras on all quantities bars 1000 lb and over.

ALLOY BARS:

1000 to 1999 lb.

GALVANIZED SHEETS:

450 to 1499 lb.

EXCEPTIONS:

(1) 400 to 1499 lb; (2) 450 to 1499 lb; (3) 300 to 4999 lb; (4) 300 to 9999 lb; (5) 2000 lb and over; (6) 1000 lb and over; (7) 400 to 14,999 lb; (8) 400 lb and over; (9) 500 to 1999 lb; (10) 500 to 999 lb; (11) 400 to 1999 lb; (12) 450 to 3749 lb; (13) 400 to 1999 lb; (14) 1500 lb and over; (15) 1000 to 4999 lb; (16) 4000 lb and over; (17) up to 1999 lb; (18) 1000 to 1499 lb; (19) 1500 to 3499 lb.

PIG IRON PRICES

Dollars per gross ton. Delivered prices represent minimums. Delivered prices do not include 3 pct tax on freight nor the 6 pct increase on total freight charges in the Eastern Zone (5 pct Southern Zone, 4 pct Western Zone), effective Jan. 11, 1949.

PRODUCING POINT PRICES

Producing Point	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Bethlehem	48.00	....	....	....	....
Birmingham	38.88	39.38	....	....	....
Buffalo	48.00	46.50	47.00	....	....
Chicago	48.00	46.50	48.50	47.00	....
Cleveland	48.00	46.50	48.50	47.00	51.00
Duluth	48.00	46.50	48.50	47.00	....
Erie	48.00	46.50	48.50	47.00	....
Everett	....	52.50	53.00	....	....
Granite City	47.80	48.40	48.90	....	....
Ironton, Utah	46.00	46.50	....	....	....
Lone Star, Texas	46.00	46.50 [†]
Neville Island	46.00	46.50	46.50	....	....
Geneva, Utah	46.00	46.50	....	....	....
Sharpsville	46.00	46.50	46.50	47.00	....
Steelton	48.00	48.50	49.00	49.50	54.00
Struthers, Ohio	46.00	....	....	....	....
Swadland	48.00	48.50	49.00	49.50	....
Telos	46.00	46.50	46.50	47.00	54.00
Troy, N. Y.	....	....	....	....	....
Youngstown	46.00	46.50	46.50	....	....

† Low Phos. Southern Grade

DELIVERED PRICES (BASE GRADES)

Producing Point	Freight Rate	Basic	No. 2 Foundry	Malleable	Bessemer	Low Phos.
Boston	Everett	\$0.50 Arb.	52.50	53.00	....	....
Boston	Steelton	6.27	54.27	54.77	55.27	60.27
Brooklyn	Steelton	5.48	....	53.98	54.48	59.48
Birmingham	Birmingham	6.09	44.97	45.47	....	....
Cincinnati	Steelton	3.67	52.17	52.67	53.17	57.87
Jersey City	Geneva-Ironton	7.13	53.13	53.63	....	....
Los Angeles	Cleveland-Toledo	3.03	49.03	49.53	50.03	54.03
Mansfield	Bethlehem	2.17	50.17	....	....	....
Philadelphia	Swadland	1.31	49.31	49.81	50.31	54.81
Philadelphia	Steelton	2.81	50.81	51.31	51.81	56.81
San Francisco	Geneva-Ironton	7.13	53.13	53.63	....	....
Seattle	Geneva-Ironton	7.13	53.13	53.63	....	....
St. Louis	Granite City	0.75 Arb.	48.65	49.15	49.65	....
Gulf Ports	Lone Star, Texas	....	50.50	51.00 [†]

Producing point prices are subject to switching charges; silicon differential (not to exceed 50¢ per ton for each 0.25 pct silicon content in excess of base grade which is 1.75 to 2.25 pct for foundry iron); phosphorus differential, a reduction of 38¢ per ton for phosphorus content of 0.70 pct and over manganese differentials, a charge not to exceed 50¢ per ton for each 0.50 pct manganese content in excess

of 1.00 pct. \$2 per ton extra may be charged for 0.5 to 0.75 pct nickel content and \$1 per ton extra for each additional 0.25 pct nickel.

Silvery iron (blast furnace) silicon 6.01 to 6.50 pct. C/L per g.t., f.o.b. Jackson, Ohio —\$59.50; f.o.b. Buffalo, \$60.75. Add \$1.00 per ton for each additional 0.50 pct Si up to 17 pct. Add 50¢ per ton for each 0.50 pct

Mn over 1.00 pct. Add \$1.00 per ton for 0.75 pct or more P. Bessemer ferro-silicon prices are \$1.00 per ton above silvery iron prices of comparable analysis.

Charcoal pig iron base price for low phosphorus \$66.00 per gross ton, f.o.b. Lyle, Tenn. Delivered Chicago, \$73.78. High phosphorus charcoal pig iron is not being produced.

FERROALLOY PRICES

Ferromanganese

78-82% Mn, Maximum contract base price, gross ton, lump size.	
F.o.b. Birmingham	\$174
F.o.b. Niagara Falls, Alloy, W. Va., Westland, Ont.	\$172
F.o.b. Johnstown, Pa.	\$174
F.o.b. Sheridan, Pa.	\$172
F.o.b. Etna, Pa.	\$175
\$2.00 for each 1% above 82% Mn; penalty, \$2.15 for each 1% below 78%.	
Briquets—Cents per pound of briquet, delivered, 66% contained Mn.	
Carload, bulk	10.45
Ton lots	12.05
Less ton lots	12.95

Spiegeleisen

Contract prices gross ton, lump, f.o.b.	
16-19% Mn 19-21% Mn	
3% max. Si 3% max. Si	
Palmerton, Pa.	\$64.00 \$65.00
Pgh. or Chicago	65.00 66.00

Manganese Metal

Contract basis, 2 in. x down, cents per pound of metal, delivered.	
96% min. Mn, 0.2% max. C, 1% max. Si, 2% max. Fe.	
Carload, packed	35.5
Ton lots	37.0

Electrolytic Manganese

F.o.b. Knoxville, Tenn., freight allowed east of Mississippi, cents per pound.	
Carloads	28
Ton lots	30
Less ton lots	32

Low-Carbon Ferromanganese

Contract price, cents per pound Mn contained, lump size, delivered.	
Carloads Ton Less	
0.07% max. C, 0.06% P, 90% Mn	25.25 27.10 28.30
0.10% max. C	24.75 26.60 27.80
0.15% max. C	24.25 26.10 27.30
0.30% max. C	23.75 25.60 26.80
0.50% max. C	23.25 25.10 26.30
0.75% max. C	
7.00% max. Si	20.25 22.10 23.30

Silicomanganese

Contract basis, lump size, cents per pound of metal, delivered, 65-68% Mn, 18-20% Si, 1.5% max. C. For 2% max. C, deduct 0.2¢.	
Carload bulk	8.95
Ton lots	10.60
Briquet, contract basis, carlots, bulk delivered, per lb of briquet	10.30
Ton lots	11.90
Less ton lots	12.80

Silvery Iron (electric furnace)

SI 14.01 to 14.50 pct, f.o.b. Keokuk, Iowa, \$80.00; \$78.50 f.o.b. Niagara Falls; Electric furnace silvery iron is not being produced at Jackson. Add \$1.00 per ton for each additional 0.50% Si up to and including 18%. Add \$1.00 for each 0.50% Mn over 1%.	
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Silicon Metal

Contract price, cents per pound contained Si, lump size, delivered, for ton lots packed.	
96% Si, 2% Fe	20.70
97% Si, 1% Fe	21.10

Silicon Briquets

Contract price, cents per pound of briquet, bulk, delivered, 40% Si, 1 lb Si briquets.	
Carload, bulk	6.30
Ton lots	7.90
Less ton lots	8.80

Electric Ferrosilicon

Contract price, cents per pound contained Si, lump size, bulk, in carloads, delivered.	
25% Si	18.50
50% Si	11.30
75% Si	13.50
85% Si	14.65
90-95% Si	16.50

Calcium Metal

Eastern zone contract prices, cents per pound of metal, delivered.	
Cast Turnings Distilled	
Ton lots	\$2.05 \$2.95 \$3.75
Less ton lots	2.40 3.30 4.55

Ferrochrome

Contract prices, cents per pound, contained Cr, lump size, bulk, in carloads, delivered.	
(65-72% Cr, 2% max. Si)	
0.06% C	25.75
0.10% C	25.25
0.15% C	25.00
0.20% C	27.75
0.50% C	27.50
1.00% C	27.25
2.00% C	27.00
65-68% Cr, 4-9% C	20.50
62-66% Cr, 4-6% C, 6-9% Si	21.35
Briquets—Contract price, cents per pound of briquet, delivered, 60% chromium.	
Carload, bulk	13.75
Ton lots	15.25
Less ton lots	16.15

High-Nitrogen Ferrochrome

Low-carbon type: 67-72% Cr, 0.75% N. Add 5¢ per lb to regular low carbon ferrochrome price schedule. Add 5¢ for each additional 0.25% N.	
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S. M. Ferrochrome

Contract price, cents per pound chromium contained, lump size, delivered.	
High carbon type: 60.65% Cr, 4-6% Si, 4-6% Mn, 4-6% C.	
Carloads	21.60
Ton lots	23.75
Less ton lots	25.25
Low carbon type: 62-66% Cr, 4-6% Si, 4-6% Mn, 1.25% max. C.	
Carloads	27.75
Ton lots	30.05
Less ton lots	31.85

Chromium Metal

Contract prices, cents per lb chromium contained packed, delivered, ton lots.	
97% min. Cr, 1% max. Fe.	
0.20% max. C	1.09
0.50% max. C	1.05
9.00% min. C	1.04

Calcium—Silicon

Contract price per lb of alloy, lump, delivered.	
30-33% Ca, 60-65% Si, 3.00% max. Fe.	
Carloads	17.90
Ton lots	21.00
Less ton lots	22.50

Calcium—Manganese—Silicon

Contract prices, cents per lb of alloy, lump, delivered.	
16-20% Ca, 14-18% Mn, 53-59% Si.	
Carloads	19.25
Ton lots	21.55
Less ton lots	22.55

CMSZ

Contract price, cents per pound of alloy, delivered.	
Alloy 4: 45-49% Cr, 4-6% Mn, 18-21% Si, 1.25-1.75% Zr, 3.00-4.5% C.	
Alloy 5: 50-56% Cr, 4-6% Mn, 13.50-16.00% Si, 0.75 to 1.25% Zr, 3.50-5.00% C.	
Ton lots	19.75
Less ton lots	21.00

V Foundry Alloy

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. V-5: 38-42% Cr, 17-19% Si, 8-11% Mn.	
Ton lots	15.75¢
Less ton lots	17.00¢

Graphidox No. 4

Cents per pound of alloy, f.o.b. Suspension Bridge, N. Y., freight allowed, max. St. Louis. SI 48 to 52%, TI 9 to 11%, Ca 5 to 7%.	
Carload packed	17.00¢
Ton lots to carload packed	18.00¢
Less ton lots	19.50¢

SMZ

Contract price, cents per pound of alloy, delivered. 60-65% Si, 5-7% Mn, 5-7% Zr, 20% Fe, ½ in. x 12 mesh.	
Ton lots	17.25
Less ton lots	18.50

Other Ferroalloys

Ferrotungsten, standard, lump or ¼ x down, packed, per pound contained W, 5 ton lots, delivered	\$2.25
Ferrovanadium, 35-55%, contract basis, delivered, per pound, contained, V.	
Openhearth	\$2.90
Crucible	3.00
High speed steel (Primos)	3.10
Vanadium pentoxide, 88-92% V ₂ O ₅ contract basis, per pound contained V ₂ O ₅	\$1.20
Ferrocolumbium, 50-60% contract basis, delivered, per pound contained Cb.	
Ton lots	\$2.90
Less ton lots	2.95
Ferromolybdenum, 55-75%, f.o.b. Langeloth, Pa., per pound contained Mo.	\$1.10
Calcium molybdate, 45-50%, f.o.b. Langeloth, Pa., per pound contained Mo.	96¢
Molybdenum oxide briquets, f.o.b. Langeloth, Pa.; bags, f.o.b. Wash., Pa. per pound contained Mo.	95¢
Ferrotitanium, 40%, regular grade, 10% C max., f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	\$1.25
Ferrotitanium, 25%, low carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, ton lots, per lb contained Ti	\$1.40
Less ton lots	1.45
Ferrotitanium, 15 to 19%, high carbon, f.o.b. Niagara Falls, N. Y., freight allowed east of Mississippi and north of Baltimore, carloads, per net ton	\$160.00
Ferrophosphorus, electrolytic, 23-26%, carlots, f.o.b. Siglo, Mt. Pleasant, Tenn., \$3 unitage, per gross ton less carload	\$65.00 75.00
10 tons to less carload	
Zirconium, 35-40%, contract basis, f.o.b. plant, freight allowed, per pound of alloy.	
Ton lots	21.00¢
Zirconium, 12-15%, contract basis, lump, delivered, per pound of alloy.	
Carload, bulk	6.60¢
Alsifer, 20% Al, 40% Si, 40% Fe, contract basis, f.o.b. Suspension Bridge, N. Y.	7.40¢ 8.50¢
Carload	
Ton lots	
Simanal, 20% Si, 20% Mn, 20% Al, contract basis, f.o.b. Philo, Ohio, freight allowed, per pound	
Carload, bulk	11.00¢
Ton lots, packed	11.25¢
Less ton lots	11.75¢
Boron Agents	
Contract prices per lb. of alloy, del.	
Ferroboration, 17.50% min. B, 1.50% max. Si, 0.50% max. Al, 0.50% max. C, 1 in. x D. Ton lot	\$1.20
F.o.b. Wash., Pa.; 100 lb. and over	
10 to 14% B.	.75
14 to 19% B.	1.20
19% min. B.	1.50
Manganese—Boron 75.00% Mn, 15-20% B, 5% max. Fe, 1.50% max. Si, 3.00% max. C, 2 in. x D, delivered.	
Ton lots	\$1.67
Less ton lots	1.79
Nickel—Boron 15-18% B, 1.00% max. Al, 1.50% max. Si, 0.50% max. C, 3.00% max. Fe, balance Ni, delivered.	
Less ton lots	\$1.80
Silicaz, contract basis, delivered.	
Ton lots	45.00¢
Grainal, f.o.b. Bridgeville, Pa., freight allowed, 100 lb and over.	
No. 1	93¢
No. 6	63¢
No. 79	45¢
Bortam, f.o.b. Niagara Falls	
Ton lots, per pound	45¢
Less ton lots, per pound	50¢
Carbortam, f.o.b. Suspension Bridge, N. Y.; freight allowed, TI 15-18%, B 1.00-1.50%, Si 2.5-3.0%, Al 1.0-2.0%.	
Ton lots, per pound	8.625¢
Borosil, f.o.b. Philo, Ohio, freight allowed, B 3-4%, Si 40-45%, per lb contained B	\$6.25